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ABSTRACT

This draft UNESCO document, an extension of a National Information System (NATIS) planning objective, provides guidelines for government planners in determining information policy, and designing and planning NATIS. It is aimed at governments who believe there is a need to develop NATIS for their countries' economic, cultural and social well-being, particularly developing countries. Sections discuss and give guidelines for: (1) structure and functions of a coordinating unit to formulate and implement national information programs; (2) terms of reference of information subsystems and possible interfaces in the areas of information, documentation, libraries, and archives; (3) the establishment, coordination, and integration of the subsystems in NATIS; (4) short, medium and long-term priorities for implementing the plan of action; (5) organizing, implementing, and maintaining the subsystems, concentrating on manpower and technical needs and financial resources; (6) participation of national systems in regional and international systems; and (7) principles of legislative framework. Most sections are followed by a checklist, and a selected bibliography is attached. (KP)

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NATIONAL INFORMATION SYSTEMS

DESIGN AND PLANNING OF NATIONAL INFORMATION SYSTEMS (NATIS)

A paper for government planners

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FOREWORD

The Intergovernmental Conference on the Planning of National Documentation, Library and Archives Infrastructures, organized by Unesco in co-operation with the International Federation for Documentation (FID), the International Federation of Library Associations (IFLA) and the International Council on Archives (ICA), met in Paris from 23 to 27 September 1974, and adopted unanimously recommendations supporting the concept and objectives of national information systems (NATIS), encompassing all services involved in the provision of information for all sectors of the community and for all categories of users.

The recommendations were subsequently approved by the General Conference of Unesco at its 18th session (18 C/5 approved, Resolution 4.201), which authorized the Director-General to draw up a long-term programme for the implementation of NATIS in Member States for submission to its 19th session in 1976, and in the meantime to take all necessary steps to ensure the most effective implementation of the recommendations of the Intergovernmental Conference, particularly "to issue to Member States, after due consultation with the appropriate international non-governmental organizations (FID, IFLA and ICA), and not later than December 1976, general guidelines for the implementation of NATIS".

The Unesco Department of Documentation, Libraries and Archives accordingly prepared an outline of the guidelines for national action needed to achieve the 12 NATIS objectives as set forth in the booklet National Information Systems : Objectives for national and international action (COM.74/NATIS/3 rev.). The guidelines proposed in this outline, which were subsequently discussed at length and approved by a group of experts meeting at Unesco headquarters from 11 to 13 December 1974, cover the following topics :

- National information policy ;
- Design and planning of national information systems (NATIS) ;
- Methodology of analysis of users' needs and inventory of existing information resources ;
- Establishment of a legislative framework for the implementation of NATIS ;
- Methodology of cost analysis for the effective implementation of the national plan for NATIS (in the context of its contribution to national development).

To provide a permanent consultative mechanism to advise the Secretariat on the preparation of these guidelines and to ensure a continuous feedback from the specialized groups in the fields of documentation, libraries and archives, a NATIS ad hoc working group was set up, composed of representatives of FID, IFLA and ICA.

As an outcome of consultations between the Secretariat and this group the first two guidelines have been prepared and are being widely distributed for evaluation.

The first guideline entitled National information policy, by Dr. D.J. Urquhart, formerly Director of the British Library Lending Division at Boston Spa (United Kingdom) is addressed to decision-makers and non-technicians. It explains why an information policy is necessary, and describes the need to assess the national situation, how to develop the information plan and how to finalize and present the NATIS plans.

The second guideline on the Design and planning of national information systems ; a paper for government planners, by Mr. Björn Tell, Director of Libraries, University of Lund (Sweden), is intended to encourage governments convinced of the need to develop national information systems (NATIS) as an indispensable tool for their countries' economic, cultural and social well-being, to create the mechanisms which could pursue that goal. It is addressed particularly, at this stage, to the information-poor countries where it might be of vital importance to organize information services to function in support of the educational and industrial policies.

It is hoped that these two guidelines will provide Member States wishing to plan and implement NATIS in their country with the necessary framework to "establish not later than December 1978 appropriate co-ordinating national organs with clearly designated powers and responsibilities for the detailed study of all problems involved and the elaboration of plans for the effective implementation of NATIS within the national framework", as recommended by the Intergovernmental Conference.

An analysis of the effectiveness of these two guidelines in assisting Member States to establish national policies and prepare national plans for NATIS will help the Unesco Secretariat to revise or extend their contents.

This draft document should be considered as an extension of NATIS objective n° 7 (see COM.74/NATIS/3 Rev).

CHAPTER I

STRUCTURE AND FUNCTIONS OF THE CO-ORDINATING BODY

The purpose of these general guidelines is to encourage governments who believe in the need for a development of national information systems - NATIS - as an indispensable tool for their countries' economic, cultural and social well-being, to work towards the creation of the mechanisms that could help achieve such a goal. In particular, these guidelines are concerned with the developing countries where it might prove of vital importance to organize information services that could be relied upon as a national resource in tackling scientific, technological, economic, societal and cultural problems.

The Intergovernmental Conference on the Planning of National Documentation, Library and Archives Infrastructures, held in 1974 at Unesco, coined the acronym "NATIS" for national information systems, and the Member States were asked to review their overall information situation in order to improve access to information through the creation of a national capability for this specific purpose. Unesco and the developed countries were also asked to help achieve this aim and a number of objectives were listed for national and international action (cf. COM.74/NATIS/3 rev.) in rather broad goals. The present guidelines aim at throwing more light on the design and planning needed on the national level to achieve NATIS. These guidelines also analyse the problems facing governments trying to integrate a policy for national information systems, NATIS, within their general educational and R & D policy, and point out various alternatives for policy action.

The guidelines are concerned with the range of information services covered by national documentation centres, libraries and archives which are entitled to take full advantage of the world's store of knowledge whatever their own contribution to it. They deal with the structure and functions of NATIS which require co-ordinating machinery, be it a committee, a council or an institute. They also propose action for improving NATIS by examining the elements, the sub-systems upon which NATIS will rely. Terms of reference for various kinds of services are suggested in order to show how these services could interface with or integrate into NATIS. Various strategies for implementing short, medium and long-term objectives and bringing NATIS into being are outlined, especially with regard to various constraints such as manpower, technology and financial resources. The ultimate aim, i.e. that of linking the national systems - NATIS - with regional and international systems, is approached with reference to a certain number of principles that would form legislative framework.

DOES YOUR COUNTRY NEED CO-ORDINATING MACHINERY ?

The NATIS document says : "Government should establish the appropriate organs for the operation of NATIS and clearly designate responsibilities and determine priorities at all levels, bearing in mind that coping with the quantities of documents and data now being produced far exceeds the resources of any single service acting on its own. It is therefore highly desirable that a central co-ordinating body (bodies) be set up to advise the government on the formulation and implementation of national information programmes and in matters related to international co-operation in these fields".

According to the traditional organization theory generally applied in governments, a hierarchical pyramid of superior policy-making bodies and subordinated operating agencies might be considered as the most suitable for such a task. On this point it is tempting to take a conservative attitude ; for as the NATIS document points out : "No one single model for a national information system (NATIS) with its appropriate networks and services can be designed capable of suiting the requirements of different countries in different regions".

Some countries might find it advisable to create national authorities at the governmental level to handle all aspects of the national information system. For others it might seem more feasible to separate the execution of the information policy from the government machine, and make it the responsibility of non-governmental organizations to be certain that funds allotted by the government for the information system are well spent.

The basic question of co-ordinating machinery could be structured in more specific terms. The formulation of broad information objectives must remain in the hands of government departments. In this way, the priority to be awarded for the development of information services within the framework of NATIS must necessarily be viewed as an extension of the overall policy for educational, scientific, technological and cultural activities which in turn are inseparable from the wider government policies.

It is the government's task to decide which areas of the information field to support, and what funds are to be allotted. As for the execution of this policy, it could be assigned to a governmental agency or to non-governmental bodies where knowledge and manpower suitable to the task are prevalent.

The establishment of one central co-ordinating body raises questions of links with other bodies in the administration. Such links which can be envisaged with the scientific and technological community, secondary and higher education, primary and secondary industries, and government. When establishing these links it seems wise to build upon what already exists so as not to loose momentum.

There is certainly no one country where there are no existing or embryonic units in the documentation, library and archive fields which could be the starting point for a national information policy. Objections might be raised against such a view, as looked at from a single vantage point, it could be claimed that this would give rise to dispersed and unrelated units whereas co-ordination is only possible if a hierarchical structure is established.

The present development shows that there are strong interactions between at least three axes : information (libraries, documentation services, analysis centres, etc.), computer technology, and telecommunications, and that each axis has its own organizational structure. What might at first sight be regarded as dispersed units, might very well fit into a multi-axis system, in which the policy would be to reveal the relationship that exist among the separate units, point out their interdependence and ensure their development along the various axes according to the priorities set.

As an illustration, it is significant to indicate how the operations in the documentation centres in some developed countries have moved along an axis which can be called a "complexity-axis". The traditional manual work involved in research in secondary publications, i.e. reference and abstracts journals, first changed into batch processing on a computer making use of machine-readable tapes of these publications, then into real time on-line searches in a central computer; recently this computer has become a mere node in a network of computers and terminals linked by telecommunications lines. With the development of telecommunications, being located close to the central processing unit is no longer necessary. A remote terminal can nowadays perform the same job for the documentation centre, as well as for the individual researcher if he has the proper communication means. Access to a growing part of the world's stored knowledge is becoming more and more independent of time and location. The development of this independence could be enhanced by granting special rates for the transfer of information via a common carrier - the telephone network - between service centres. An alternative to this could be the setting up of special information networks, examples of which are emerging in several industrialized countries, e.g. CYCLADES in France, CUDN in Australia. Such development should be borne in mind when setting priorities.

A review of the existing services for supplying information could be a source for a number of proposals for improving NATIS. From the planner's point of view these proposals could be divided into five broad categories :

1. to improve the training and education of potential users ;
2. to train librarians and information officers ;
3. to improve access to existing services ;
4. to improve and expand existing services ;
5. to create new services.

In the following pages various action plans are proposed. In some cases their aim is to reorientate existing services, in others to set up new services which will generally involve additional resources. As compared with the resources needed for R & D, the total resources required by information services come to only a small fraction. Planning should be calculated on the basis of the resources that could be usefully employed throughout the planning period. Mention is made in this paper of constraints with regard to manpower, facilities, financing, etc., which will limit any action plan over the years.

FACTORS WHICH FAVOUR A CENTRAL CO-ORDINATING BODY

If the objective of a national overall programme for information and documentation is to provide access to the world's store of knowledge, this programme has to be supported by suitable national infrastructures. Essential infrastructure components are a national library system, a national system of archives and records administration and a system of general and/or specialized documentation services.

Elements of a library system should include a national library, university libraries, public libraries, school libraries and various types of special libraries. As for archives, possible elements are national archives, regional archives or record offices and departmental or institutional archives and record centres to handle current and semi-current records. Documentation services can be of various forms. In many countries all or most of these elements exist, but their development has often been a haphazard affair with no overall co-ordination. There is, however, a growing tendency to base further development on systematic plans for the various sectors or even for the whole field of information and documentation, comprising all services concerned. Such plans can only be successful through co-ordination, but the difficulty lies in making this co-ordination comprehensive enough to meet the growing and changing needs of the users. Developing countries, where an infrastructure is just emerging, could especially benefit from the early establishment of a central co-ordinating body.

Another reason for the existence of such a body is that the government itself could benefit from technological advances, in particular from the enormous potentialities of information/computer/telecommunications techniques, and by a large scale involvement transform these into new systems and new job opportunities. As societies grow more complex, the establishment of a central co-ordinating body could serve to harmonize the many separate decisions required to develop the infrastructure mentioned earlier.

Information activities present an organizational problem which must be understood if the co-ordinating body is to be governmental. Unlike all other problems which can be referred to one department or another, information is concerned with activities in all departments involved in attaining the societal goals. Even if the co-ordination of information is centralized within a specific department, decentralized information activities will continue to exist at all levels, from the government down to individual schools or industrial firms.

THE FUNCTIONS OF THE CENTRAL CO-ORDINATING BODY

A central co-ordinating unit would be in charge of establishing the plan, acquiring resources and distributing responsibilities, as well as of international liaisons on the governmental level. It would not be expected to carry out operational activities, but rather to initiate activities by delegating them to project groups or operational agents.

Thus, the central co-ordinating body assigned to act as the NATIS agency, would have to consider both the overall information policy of the government with its international ramifications, and the functions of all decentralized activities in keeping with the infrastructure, i.e. a government department information unit, a special library, a technological documentation centre, or an archive.

Within the framework of the financial constraints the NATIS agency is responsible for harmonizing every decision and action to both the short-term needs and those of a long-term future. An immediate increase in the efficiency of the library system could be beneficial for the whole educational and industrial structure. However, to support libraries requires careful government planning of the focal point. Thus, its decisions are determined by the objectives agreed upon within the government, and it is up to the NATIS agency to communicate these objectives to all concerned in order to co-ordinate their performance.

Another function is to divide the activities required to fulfill the objectives and to define an organizational structure in which specific persons are responsible for the job to be done. It is suggested above that elements, when they do already exist, be used as a basis for building upon. This would mean that the NATIS agency would have to analyse how such elements could fit into the overall structure, and what new elements to establish.

It is essential for the various existing and newly established units to provide coherent reports so that the NATIS agency can evaluate their performance in relation to the objectives. Unesco library statistics could serve as an initial yard-stick, but would have to be expanded upon to cover the other sectors of the information field. Finally, the planning of manpower development is also a function of the NATIS agency.

ORGANIZATION OF THE CO-ORDINATING BODY

The NATIS document proposes that the central co-ordinating body (or bodies) be composed both of representatives of all appropriate government departments, state bodies, and semi-official institutions, and of representative specialists from the information field. This seems to indicate a rather large number of people.

Among the more recently established organizations, the British Library board has 14 members, while the Swedish Council for Scientific Information and Documentation has only 5, the Argentinian National Commission on Archives 9 and the National Archives Committee in Nigeria as many as

23 members. The number to be chosen will have to be in proportion with the size of the country and the complexity of its social and administrative structures, and take into account the difference between a centralized and a federal organization. For a developing country the envisaged co-ordinating body should not be too large. A body with a maximum of 16 members could act with agility, give fast response and focus on available resources.

To start with, a small body might be established which would be expected to be innovative in the information field, and teach new methods and their utilization in documentation, libraries and archives. It is possible to conciliate the viewpoint of broad representation in a two-step approach:

a) a representative assembly of participants from all the various bodies and institutions mentioned with NATIS document cited above. This assembly would meet once a year and have advisory functions. The chairman would be nominated by the government ;

b) a small co-ordinating unit - the national committee for NATIS, UNISIST, and other international programmes. This unit would be composed of, say, two members elected by the representative assembly, and two members assigned by the government, which would then assign a fifth member to act as chairman.

The administrative burden for the two bodies would be handled by a secretariat. This office could be set up rapidly in the government so that it could take appropriate action to execute all arrangements when constituting the advisory and the executive bodies. The secretary could be a person with subject knowledge in the field, or could be an administrator in the government in which case he would have to work in close co-operation with an information officer. As the secretariat would be a governmental agency responsible for NATIS and UNISIST and interacting with the international organizations in the information field, it could prove convenient to locate it in the planning department. This would facilitate the inter-departmental linking of its activities. However, no uniform model can be suggested. The solution will depend on the division of governmental functions in each country.

Checklist for the first chapter concerning the co-ordinating body

1. As your country has expressed its willingness to adhere to the NATIS concept, many national and international organizations are now awaiting your government's first step. A prompt decision to set up a central co-ordinating body - a NATIS agency in your government is the first step towards NATIS.

2. Information is indeed the concern of all government departments, and especially of those forming the educational, cultural and industrial policies. The co-ordinating body should be located where these policies are set, and links be established with all other departments and with the existing units forming the infrastructure of information, i.e. those units which have or could develop capabilities to serve users' needs.

3. Since the NATIS agency will act as a secretariat, your government is advised to set up a governing body - a national committee for NATIS and UNISIST which the secretariat should serve. This body could be a small committee reporting to the government.

4. For the broader representation of all interests concerned, the government could invite the participation of an advisory assembly with representatives of various government departments, institutions, industrial organizations and of the professional associations of librarians, archivists and documentalists. The heads of the central agencies in the field of documentation and information (i.e. national library, national archives, etc.), could be ex-officio members.

5. The main task of the co-ordinating body would be to advise the government on the formulation of an information policy and to execute its implementation. In order to make the body stable in the long run, the decree establishing it would have to leave room for a maximum of flexibility. Its functions have to be defined in broad terms covering the following points :

a) the setting of objectives which conform to the NATIS concept and the specific policies for educational, cultural and industrial development, and to the general policy for economic, technological and societal development of the country ;

b) the communication of the objectives to all concerned ;

c) the planning needed to fulfill these objectives ;

d) the division of tasks and the overall organizational structure ;

e) the setting of responsibilities for the job to be done ;

f) the proposals for financial resources ;

g) the appraisal of the performance and required reporting ;

h) the planning of manpower development ;

i) the international liaisons.

CHAPTER II

TERMS OF REFERENCE OF SUB-SYSTEMS WITH THEIR POSSIBLE INTERFACING

If the government promptly announces its intention to set up a new national information policy machinery for NATIS, in accordance with the functions set out in Chapter I, it would then be necessary to take stock of the existing state of information in the country. The precise form and character of the national information system would vary in different countries, as it would be made up of a number of elements - sub-systems - which in turn could differ in their structures. Each country would have to determine its national needs and priorities in the field of information, and decide which knowledge store it cannot strategically do without, so that it could avoid placing undue reliance on other countries, while in other cases it might be desirable to pool resources together among countries in a region.

The goal here is to define the terms of reference of the existing sub-systems, find out what their interfaces are and how the necessary co-ordination can be achieved. This chapter is devoted to various sub-systems in the information field.

However, before going into the question of infrastructure, i.e. the national capabilities for providing service to the users, it should be pointed out that the strengthening of information services to provide more and better information to the user does not solve the communication problem among services or between an information service and its users. On the contrary, the more information there is, the greater is the need for functioning and effective communications, that is to say, the more information the greater the communication gap is likely to be. Those countries desirous of benefiting from the information explosion will have to have a careful look at the way their communications function.

The building of huge library collections does not produce information, all it produces is piles of recorded information. Modern information services need the back-up of well-organized libraries. However, disregarding collections needed for strategic purposes, the big depositories of the world's knowledge could, to a large extent, be located outside the national borders, if the strength of the communications network permits the country to tap these depositories.

From the outset, therefore, it is recommended that, when organizing the infrastructure for today and for the future, international co-operation be relied upon and strengthened so as to make efficient use of global stores of knowledge. Smaller countries in particular should consider the possibilities of pooling resources for the establishment of communication means and of avoiding unnecessary duplication in their national sub-systems.

SUB-SYSTEM STRUCTURE

In the Medium-term plan for the Unesco activities (18 C/4, para. 239) the Director-General states : "One of the basic difficulties facing Member States is how to integrate the planning, establishment and development of appropriate information infrastructures within a global system of national infrastructures. The presence of appropriate information, documentation, library and archive services is the necessary prerequisite for effective support to the economic and social development of Member States ...".

This chapter takes as its starting point the elements he mentions in the infrastructure : information, documentation, library and archive services. But one point must be made clear at the outset. Although the Director-General expresses the need "to integrate ... the information infrastructure within a global system" which at first could indicate a sort of "totally integrated global system", this does not mean that all information activities should be included in a single system, nor that they should be totally integrated. The question raised is rather : which information activities should be kept together, and which kept apart ? New and unconventional information activities need not absolutely be subordinated to traditional operations ; it is up to the co-ordinating body to tackle the question of just how far co-ordination is to go. Bearing this in mind, the NATIS on one hand and the UNISIST on the other could be seen as expressions of two Unesco programmes for global integration of information.

In Chapter I it was pointed out that existing elements could be of importance when projecting the NATIS. A UNISIST document (SC/74/WS/52) expresses the point concerning existing systems in this way : "They provide the foundation for any additional activity and, properly inventoried, not only assist in the identification of gaps and deficiencies, but also indicate possible short- and long-term solutions. For a detailed method on how to conduct such an inventory which implies parameters to be considered", the document cites another UNISIST paper on the conduct of a national inventory of scientific and technological information and documentation facilities (SC/75/WS/28). The latter document deals with some problems of local infrastructure, although it explicitly excludes a most important area dealing with school and public libraries. Unesco will also provide other guidelines covering a broad spectrum of the information field.

When attempting to distinguish elements of the infrastructure and existing sub-systems, the following checklist of information stores, cited from the document (SC/74/WS/52) above, could be helpful :

1. Libraries, documentation centres, archives. These represent the principal stores where most of the formal and informal literature, pictures, maps, etc., are collected, indexed, stored and made available for retrieval. Their rôle varies with the type of institution to which they are affiliated and the following grouping is of imporance in that respect :

. Academic libraries
. Public and school libraries
. Special libraries
. National libraries
. National archives
. Newspaper archives
. Institutional archives
. Document collections or documentation centres.

2. Information centres. This type of information store is not necessarily identical in its characteristics with the type of store mentioned above. Frequently information centres principally have switching and reference functions, often incorporating data collection and dissemination activities. Principal types are :

. National information centres with general and specific functions ;
. Specialized information centres, mission- and subject-oriented ;
. Industrial information centres or services ;
. Information analysis centres.

3. Government information sources. Important segments of the national information infrastructure are located in government and public services, and also in services of semipublic or even of an international character. Statistical, managerial and administrative data legislative information, policy and decision papers, surveys, expert reports, etc., are found in :

. Offices and various administrative units of government ;
. The legislative and the judiciary ;
. Office of the State Comptroller ;
. Regional and local administrative units ;
. International agencies and foreign embassies.

4. Societies. Various types of associations are sources of information, principally through the expertise which their members can provide, but also through the various services which they frequently offer. Principal types to be considered are :

. Professional societies (e.g. chemists) ;
. Humanitarian societies (including funding organizations, e.g. Rockefeller foundation) ;
. Academic associations (including academies, e.g. Academy of Sciences) ;
. Technical associations (e.g. building contractors) ;
. Economic associations (e.g., banks) ;
. Trade unions and labour organizations.

5. The publishing and printing industry. Whether operating on a profit-making basis or for any other purpose the printing and publishing industry is an important information source, in its own right as well as by its relationship with kindred organizations inside the country or abroad. Principal types to be considered are :

. Newspapers and magazines ;
. Professional publications of any type ;
. Book publishers and printers.

The list quoted shows the diversity of agencies and locations, which produce or store information in various forms. The separation between libraries, documentation centres and archives, as listed in the first group, and other sources of information inside and outside the sphere of public administration may tend to obscure the fact that information functions in the various governmental agencies listed as well as in associations or business firms are also organized in the form of library sections, archives or registries and documentation services. Thus a checklist, which attempts to distinguish among the different sectorial functions, could be established along the following lines :

a) Library services :
   . National libraries
   . Academic libraries
   . Public and school libraries
   . Special libraries
   . Departmental and institutional library services (attached to government agencies, research institutes, associations, business firms, etc.,)

b) Archives and records services :
   . National archives
   . Departmental archives, record centres and registry services (serving one or various government departments)
   . Regional archives and record centres
   . Institutional and business archives
   . Radio-television and newspaper archives

c) Information and documentation centres :
   . National information centres with general and specific functions
   . Specialized information centres, mission and subject-oriented (possibly attached to government agencies, institutions or associations, working in the respective field);
   . Industrial information centres or services.

The functions of these organizations overlap, and in many countries an overlapping between private and public services is traditional. In some countries the information systems of government agencies have evolved without any government policy concerning the relative rôles of private and public enterprises. Any country could tick off some or many of the above elements as well as existing sub-systems. There is a need for some guidance to decide which terms of reference are to be preferred in conjunction with the development of the NATIS concept, which segments of the information systems should be subsidized by the government and which could be left under private control.

PRINCIPLES GUIDING THE TERMS OF REFERENCE

The very concept that the objective of NATIS is "to encompass all services involved in the provision of information for all sectors of the community and for all categories of users", creates problems which can only be approached in a pragmatic or heuristic manner, as nobody has yet seen or planned such a system. The same holds true for the implication in the NATIS concept that "the government should maximize the availability of all relevant information through documentation, library and archive services just as it takes responsibility for the basic education of its citizens" (Cf. COM.74/NATIS/3, p. 9).

The provision of information for all sectors of the community and for all categories of users must, for a planner, immediately raise questions of priorities in the light of the national overall policy and sectoral planning. In view of what already exists in terms of, for instance, library services, some awareness as to the extent to which the new technologies could be applied is necessary. It is evident that government support in many countries is still to a large extent sector-oriented, which means that planning is by traditional thinking in terms of documentation centres, libraries and archives. A country wishing to start afresh should shift its thinking to problem-oriented rather than sector-oriented planning, so that it can take advantage of opportunities for innovation to serve the user. For instance, the necessary guides may not be available to a user to assist him in his search for needed information, or if he knows the reference to the desired document, copies might not be available locally or within a suitable time to be of use to him. The development of suitable guides, collective catalogues, directories, as well as qualified manpower such as information officers, and that of suitable stores of documents, reproduction facilities, mail service, telefacsimile, etc., are just a few examples of problem-oriented planning, whereby the country itself could play a rôle in the international scene.

The best way to explain how terms of reference for information systems in various areas could be set is to take three different examples in the hope that each of them is pertinent to the situation in a country, and to show some possible strategies for changing the existing services - sub-systems - according to user needs.

1. The problem of transfer of technology and support of industrial development

The following paragraphs deal with the information activities that are needed if the government policy is to further the transfer of technology and industrial development.

The economic support and loan-giving policy of the government will have a major impact on individual firms, because a large proportion of the transfer of technology takes place as the result of activities in the industrial sector of the economy. This means that economic factors have a major effect on the process of industrial development and the transfer of

technology. The willingness to invest in development and new technology is related to the willingness to adopt new technologies.

A recent survey showed that most Australian industrial companies or firms lack adequate library resources of their own. A Swedish study showed that the knowledge the managers of firms which have gone bankrupt have about their own business is far below an average tolerable level. As a consequence, persons in companies which have no information resources have no opportunity of using primary or secondary publications to improve their knowledge of relative literature. Since the most frequently used sources of information are scientific and technological journals, followed by handbooks and technical reports prepared within organizations, the problem of lack of information becomes compounded.

In Venezuela, loans from the state development bank to industrial firms are issued with a clause that the firm accepts technical assistance from a specific team sent by the bank, and to cover the costs for this service 1 1/2 % is deducted from the loan. The experiences of such teams reveal that the firms they visit have done very little information work. A primary task is to bring the manager up to date on the state of the art in his own field, on the outlook for the future, and on various alternatives for development. There is no secret involved, as the information and library material are available in the country, but there is a high rate of failure among the loan-seeking firms to acquire needed information.

Many firms are not conscious of needing any information. Others are vaguely conscious of the need and often believe it is being met by having a staff member read trade journals. If they receive any professional information, it is usually through vendors ; trade literature and trade pamphlets are the most frequently used sources, but little attention is paid to improving their circulation and availability in the firm. Neglecting to use patent information, for exemple, could prove very expensive not only to the industry but to the nation as a whole.

Now, how can a frame of reference be drawn up for sub-systems that will satisfy the information need in this problem area, and if the promotion of sub-system is inherent in government policy for industrial development, how will it then serve the individual firm ?

It is obvious that this frame of reference must include the library chain which provided the background knowledge for the visiting team in the example above : school libraries - academic libraries - public libraries, which all support the educational system for primary, secondary, higher and lifelong education.

The additional information they need to tackle the problems of a specific firm relate to economic and market conditions, the technology in the field of activity of the firm, business and personnel management. Part of it could be found in well-equipped public or academic libraries, part in government agencies such as productivity centres, statistical offices, in trade associations, chambers of commerce, etc.

In order to reach these sources, guides should be published and a national reference centre set up to assist all those who have questions on business or technology which will refer them to organizations capable of answering such questions. The reference centre would provide the single facility to which anyone could turn for advice on where to obtain information on specific topics in business or technology.

Examples from some countries also show that the setting up of a field officer service, like the Venezuelan team mentioned above, or the Industrial Liaison Officer service at British technological institutes, or the DTO-service in Denmark, to visit individual firms or government plants to provide technical information and assistance towards finding a solution to production or marketing problems, has been given high priority, which is why such a service should be included in the frame of reference. In the primary industries the field extension service on the FAO model fulfills the same function.

Finally, some form of formal training in searching for information should be included as a subject in secondary and higher education to condition the potential user as well as the potential information officer. The conclusion to be drawn is that in the problem area of government support for industrial development, the information policy must englobe academic and special libraries, a national reference centre, field officer service, and a training programme for users and information officers.

2. The problem of illiteracy and non-informed electorate

One area in which many developing countries find specific deficiencies or inequalities calling for large-scale action is that of illiteracy and in particular education for rural development. In other countries a confidence-crisis exists between the government and the people. This can be attributed to difficulties in providing information to the people. The political will has to have the support of the general public, that is to say : an informed electorate is essential to national well-being. Fighting illiteracy and extending literacy training into lifelong education becomes a necessity for development.

Some developing countries have enlarged their educational programmes and increased the production of suitable reading material to combat illiteracy and provide people with lifelong opportunities for self-development.

The rural world is in general especially underprivileged from the point of view of access to education and the quality of education as compared with the urban world. Education clearly has a twofold function in this connection, and again the Director-General of Unesco can be cited (op. cit. para. 264) : "It should stimulate country-dwellers to understand and appreciate their environment, and train them to work and live there, while at the same time enabling them to change, if they so desire, to non-rural life".

A prerequisite is the support of school libraries : the library service must be planned as part of the primary and secondary school system. This is even more essential for public libraries if they are to serve as centres of popular education, to support and continue the work where teachers have left off. Without public libraries, those who have learnt to read will gradually give up reading and relapse into illiteracy. An example worth mentioning is the rôle the New Delhi Public Library has played in its efforts to eradicate illiteracy among adults, e.g. porters and shoe-shiners around the cities'central station area.

It is evident that public libraries could serve a number of needs if they were given adequate support. It can also be seen in a number of countries that school libraries for primary and secondary education have been successfully integrated into public library systems. The establishment of public libraries often involves government, but mostly community money, in general, and so, if for no other reason, is clearly a matter of government concern. Thus it would appear wise to pursue the development of dual usage, especially when building up a local infrastructure.

However, no library can be self-sufficient. It is therefore a good policy to support the immediate needs for books and journals, which will be heavily used, and rely on inter-library loan service, photo-reproduction, or translation service for specific problems. There is no point in providing a good stock of the great classics of literature in an area where half the population is illiterate. The public library will be fare more useful if it provides simple community development types of literature on health, agriculture, home crafts, and the like, and will then prove to be a potent force in community development. The set of Standards for Public Libraries prepared by Unesco could be applied.

Another point that must also be made is that literary material alone is no longer enough. As an example, from a country where the distances are great, it is worth mentioning that the Australian National Library has one of the biggest film-circulating libraries in the world inside its vast territory alone. Other means of communication besides the mail service such as : telephone, telex, tele-facsimile, electro-writer, electronic blackboards, etc., are needed for services covering long distances to sparsely populated areas. When making budgetary provisions for the national information plan, priorities should be accorded to the development of communications and reprographic means.

The conclusion to be drawn as concerns this problem area is that a library system which functions along the lines indicated has to be a part of the overall picture. It could also be said that to administer these resources, including an extension service, bookmobiles, etc., qualified personnel is needed, and a training programme would therefore appear to be indispensable. By extension service is meant a service that would reach people far from libraries, e.g. by bookmobiles, or by the deposition of book-boxes (including educational films, video-tapes, etc.) as well as transportation means for the exchange of material at regular intervals.

3 The problem of strengthening policies and strategies for development

The third problem area chosen as an example relates to the government planner's own situation, namely as decision maker in government or government agencies. He must make his decisions on the basis of information selected from the entire environment in which the country is situated : political groupings, national income, taxation, agricultural and technological development, world economy, etc., and combine his findings with all other factors that might influence his decision.

To set the stage again, another citation by the Director-General of Unesco is relevant (op. cit. para. 153) : "Decisions need to be taken as to the forms of development desired in the light of the possible consequences of alternative policies. For this to be done meaningfully the options should be clarified and methodologies elaborated which permit analysis to guide policy decision". He exemplifies this by saying : "The stress should be on the interaction of policies, e.g. the social effects of environmental change brought about by carrying out an economic plan of industrialization, the socio-economic and cultural aspects of educational expansion, the demographic repercussions of cultural policies".

The direction to be taken is shown in the following words : "Planners and decision-makers need access to vastly improved sources of information and methods for their utilization ... More information on the complex socio-cultural changes associated with rapid development must be obtained and analysed if we are to ensure that development is progressive in the broadest sense, that it is directed towards greater social justice and that economic efficiency is not achieved at the expense of important human values".

At present, the decision-maker in any country draws upon information sources located not only in the government and public services, but in services of semipublic or even of an international character as well : statistical, managerial and administrative data, legislative information, policy and decision papers, surveys, expert reports, etc. Usually, these sources are compartmented in locally dispersed libraries, archives, information centres, etc., or confined in various offices which have very little communication between them.

Vast amounts of data about social phenomena are gathered and stored by all these organizations including governments, often as a by-product of their regular administrative activities. Therefore, most information relevant to planners will continue to be a kind of ad hoc data, collected as accessory to particular studies or inquiries, if information methods are not improved.

Another reason for Unesco's interest in the decision making process is that traditional planning theory winds up as part of general recommendations on how planning should or could be done. A concentration

on formal planning, seriously limits its usefulness in the designing of changes and in the adaptation to new objectives. Traditional planning has also been far too taken up with data collection and projections from these data, and too little with reflection on the relation of data concerning the present state of a problem area to the planning process.

The planner's problem is not necessarily to find out "what is known", but rather "what is stored now in local memories". This does not mean that the solution is decentralized information-producing activities. Information activities present a special organizational problem ; they have to be both centralized and decentralized down to the smallest and most remote administrative unit of a society. Such insight furthers an approach which takes into account modern information and communications technology. Obtaining information from other parts of the governmental system becomes an alternative to generating and storing it for uncertain usage in the future.

Comprehensiveness in information gathering is not in itself an important or desirable planning goal. In urban planning, for example, the key problem arises from interdependencies in land use. Planning a new city in the middle of the jungle is quite different from planning for existing cities. If the planning is focused upon key factors - the shape of cities will depend crucially on how people, commodities and messages move - information demands will be quite different from planning conceived as comprehensive data gathering for predictions and control of, for example, the transportation system.

The same holds true for co-ordinating or integrating existing information elements or sub-systems into NATIS so that it can serve decision makers. The key problem is the interaction process which directly touches upon government decision variables, viz. how various information elements in the government sector should change. An indirect method of influencing such problems of society is used below. This method is not contained in the framework of traditional planning concepts.

The conclusion to be drawn is that planners and policy makers, because of their professional background, are most aware of information sources available to their own professions, but they are often unaware of relevant information from other areas of knowledge or in other governmental offices or departments. Support is, therefore, needed for information gathering programmes, allowing for the two facets of information which needs to be centralized and decentralized. The introduction of modern information handling and communications means could facilitate the access to files of pertinent data that exist within a country. Through the introduction of new planning methods the need for "comprehensiveness" could be avoided.

TERMS OF REFERENCE FOR SUB-SYSTEMS

The foregoing paragraphs dealt with the variety of demands which a government policy for the development of industry, of education, and of the planning and decision making process in the government itself impose on information systems. The fulfillment of demands implies a governmental responsibility to carry on executive action directed towards the fulfillment of certain more specific goals and objectives, and the point is now to list a set of objectives for the sub-systems which a government should set up and strive to achieve, with the ultimate goal being that of integration into the national information system, NATIS.

In order to facilitate the comprehension of various sub-systems, the terms of reference are delineated according to the areas mentioned by the Director-General above :

1. The information area

This heading covers the transferable or communicable knowledge, which is "information", consisting of packaged information. The view of NATIS (objective 9) is that the national information plan should include adequate provision for the application of information technology.

In overall national information systems, the sub-systems particularly focused on the information area can be given the following terms of reference, namely to :

- determine the national needs and priorities for information, and those knowledge stores the country cannot be without for strategic reasons ;
- exploit, by modern methods, the possibilities of drawing on the world's store of knowledge for the information needed for government, industry, research and education ;
- obtain such access by suitable investments in information/computer/telecommunications systems and set limits for their capacities ;
- strengthen both the governmental and non-governmental information and communications systems, and close gaps in knowledge ;
- establish mechanisms for the repackaging of needed information and its adaptation to local needs which could involve translation into the national language ;
- encourage manpower and educational programmes for the development of trained personnel in information handling, and support user training ;
- draw up guidelines for the interface of the information sub-systems with libraries and archives.

These might seem to be rather ambitious terms for those countries deprived of the use of telex, computers or terminals ; but planning for NATIS means that the plan should provide for the creation of new capabilities and facilities in an international context and based on principles of compatibility and standardization.

The terms above refrain deliberately from putting special emphasis on scientific and technical information, STI, for many reasons : this is the main area covered by the UNISIST programme, and NATIS and UNISIST can be seen as facets of an overall plan for development in the member countries and internationally ; national systems for STI must be designed so that they are accessible to the world-wide scientific community and responsive to its standards, while on the other hand the application of science and its transformation into technology depends greatly on national capabilities, and special attention is needed from policy viewpoints ; information about science and technology and their consequences for policy makers is perhaps as important as information to scientists and engineers ; STI needs to be interpreted in non-specialist language and then combined with economic and social and other kinds of data to provide the kind of information required for the major decisions in society ; NATIS aims at providing a framework for concerted action at the national level.

2. The documentation area

During recent years the concept of "information" has come to be used more or less as an equivalent term or synonym to the old term "documentation". As the term "information" has already been used with a specific meaning above, the term "documentation" can also be given an operational definition, namely the activity of collecting, ordering, retrieving and presenting documents in a specific subject field.

The documents which are especially subject to this activity were formerly called non-library material, i.e. technical reports, patents, standards, articles in periodicals and specific parts of books, proceedings, preprints, etc., where the analysis of the content was regarded as a main activity. In the sense of this report "documentation" is conceived as the activity of bringing together non-library material into a common pool. A sort of clearing-house, independent of the official archival responsibility for printed and unprinted government records, referred to under paragraph 4. The terms of reference for a national policy for this type of documentation work could be formulated as follows, namely to :

- establish a mechanism which is responsible for the collection, ordering, storing, retrieval and presentation of all administrative documents in government bodies ;
- adapt this mechanism to various levels of centralization and decentralization depending upon the users' needs ;
- find ways in which national documents could be integrated into international data banks, e.g. agricultural documents into AGRIS, documents on development programmes and policies into DEVSIS, nuclear into INIS, documentation research into ISORID, etc.

. establish document exchange with other countries ;

. make use of modern reprographic methods ;

. encourage training programmes ;

. design the links which should be established with libraries and archives.

3. The library area

Formerly there was a line of demarcation between documentation and libraries ; but with the increasing emphasis on information, there is a tendency to speak about second generation libraries which consists of a network of libraries in which information and documentation activities are, to a large extent, integrated. It has also been found that when a country supports mechanized documentation service in the form of SDI (Selective Dissemination of Information or a current awareness service from interest profiles) or in the form of retrospective searches from terminals, a library back-up service is a necessity to serve users by supplying full documentation referred to in the printouts.

NATIS presupposes that an interrelated network or networks of school and public libraries should be established and developed to incorporate media resource centres and cultural centres in support of in-school and lifelong education, literacy programmes and national plans for book development alongside of the documentation services mentioned above, which are geared to meet the needs of specific user groups.

If educational extension is approached in a broad sense, the public library system will support not only vocational training but also extension courses for those engaged in the working world to fill the gaps in their original education and training, or to improve their cultural qualifications in national history, economics and literature, for their own culture, should they so desire.

Thus, various coponents of a second generation library network can be distinguished, and the terms of reference for the sub-systems could be defined in the following terms, namely to :

. provide scientific, technological, economic and societal information necessary for the development of the country ;

. act as an important supplement to formal education ;

. maintain reading habits and promote a high level of community awareness ;

. equip citizens for intelligent participation in the democratic way of life as an informed electorate.

An elaboration of the last point can be found in the Unesco Public Library Manifesto.

4. The archives

The increasing scope of governmental functions, which tend to affect all aspects of political, social, economic and cultural life, leaves its mark by the steadily growing production of records. These records which, in addition to documents, include audio-visual and machine-readable records created in the course of administrative or judicial transactions, have both an informative and an evidential quality. This is also true of records generated in institutions and business firms, in associations and by private individuals (politicians, scientists, etc.) which in due course may be turned over to public archives repositories. Informative and evidential values are criteria for the selection of records for permanent archival preservation, while the large majority of records of transitory value will have to be destroyed after a certain period of time. An efficient records management system has to ensure the organization of current records, the temporary preservation in various types of record centres on the basis of record retention plans and the selection of records for permanent preservation according to specific appraisal standards. Prearchival records administration has to be closely connected with archives and record offices, which are the guardians of records of permanent value.

Archives and records definitely form an essential part of the general information and documentation system, and a certain amount of co-ordination with the other areas is indispensable to ensure the best possible use of the information contained in records and archives for administrative and research purposes. This is true for the organization of registry services and records kept in the administration as well as for the arrangement and description of archival records to provide easy access to all relevant information. Possibilities offered by the utilization of modern information technologies have to be considered. In industrialized countries, for a variety of government activities (such as the census, land registry, birth and death registration, accounting, taxation, etc.), traditional paper records are being replaced by machine readable data stores. Here archives, aside from providing the permanent archival preservation of selected data materials, could play a rôle in the co-ordination and integration of data storage for the whole of public administration. An integrated governmental data system with the utilization of adequate technology could improve the availability of existing information to all government agencies and thus contribute to the improved co-ordination of administrative processes. This shows the rôle of archives and records administration as the common memory of the administration and as an administrative information centre.

On the other hand, archives as the evidential documentation of the political, social, economic and cultural history of the country have a specific function, which sets them apart from the other information subsystems as treated in the previous chapters. Contrary to other information and documentation materials, most archival documents are unpublished and unique, thus calling for special measures insofar as security and physical conservation are concerned. While libraries which were destroyed in the Second World War, such as the National Library in Belgrad, have been able

to restore more than 97 % of their collections, the destruction of national archives would mean the almost irreparable loss of unique documentation, which forms an important part of national heritage. The evidential value of permanently preserved archival documents, which is determined independently of present-day information needs, also calls for specific forms of archival arrangement on the basis of the principle of provenance. This, of course, does not preclude additional, subject-oriented retrieval aids to facilitate general accessibility for research purposes, and the inclusion of archival information in the general information system.

The terms of reference for the archival area could be formulated as follows :

- organize an effective records management system for the various government departments and agencies, including filing systems, retention plans and temporary storage in record centres, disposal schedules and standards for the selection of records for permanent preservation ;

- organize conservation, arrangement and description of permanently valid records in archives and record offices to improve their accessibility within the general information system ;

- co-operate with librarians, documentalists and information specialists in the usage of modern techniques of storage, conservation and retrieval ;

- organize and carry on professional training in co-ordination with the other areas ;
- ensure international co-operation and advice, though control of the archive systems will have to remain with the nationals of any country ;

- organize the record management in administration ;

- set up dormant records appraisal standards ;

- prescribe rules for selection, filing systems, disposal schedules, etc., i.e. archival services strictly speaking ;

- co-operate with documentalists and librarians in the usage of modern techniques for storage and retrieval ;

- organize and carry on professional training ;

- seek advice internationally, even though the essential characteristic of archival sub-systems is that they are and must be controlled by the nationals of the country.

Checklist for the second chapter about sub-systems and their terms of reference

1. Since a prerequisite for better utilization of information sources is good communications, a policy for the development of the NATIS must include a reappraisal of the policy in the general field of computer and telecommunications policy. The central co-ordinating body for NATIS could contribute to a better understanding within the government of the economic and social implications of the combination of computers and telecommunications and associated technologies together with information for technological development and support to industry, to education and to policy makers.

2. When developing the infrastructure, smaller countries should investigate the possibilities of pooling resources in order to avoid unnecessary duplication.

3. Any country can tick off some or many elements in what is called a list of information stores in this chapter. It is recommended to do this in the form of an inventory in order to find out how NATIS could build upon existing elements.

4. A few examples of general objectives for establishing an infrastructure of sub-systems are mentioned above, and at the same time some new types of services have been shown, e.g. information liaison officers. It is difficult to see how these objectives can be attained without government support, which is why the government should take the responsibility for their development.

5. The terms of reference for sub-systems in four areas have been discussed. Although these areas are quite distinct in many developed countries, a fresh look would tend to integrate the sub-systems in the first three areas to a large extent, and to a lesser extent in the last one.

6. An important part of government responsibility for all sub-systems is the training function which embraces both the professionals and the users.

7. The traditional planning process, when used for accommodating changes and adaptation to new objectives, has to be supplemented by an interaction process which uses an indirect method for making the influence of the central co-ordinating body felt.

CHAPTER III

THE ESTABLISHMENT, CO-ORDINATION AND INTEGRATION OF THE SUB-SYSTEMS IN NATIS

A clearer view of the situation could be had by setting up an organisation chart.

In order to clarify reflection on the present situation it might be useful to draw up an organization chart, using as its starting point the inventory mentioned earlier. An organization chart of this sort has been drawn up in many of the developed countries, and has proved helpful for government planning. A general model of such an organization chart in the scientific and technological information area is presented in fig. 1. A sample of its contents for a small country like Finland is shown in fig. 2. In order to encompass other areas of human knowledge as well, or areas of specific importance for the development of NATIS, additional boxes have to be supplied, e.g. public libraries, cultural centres, archives, special collections, etc.

No global system has ever actually been seen.

This chapter will, however, deal with the establishment of the sub-systems needed as an infrastructure for NATIS. As nobody yet has seen a global system of national sub-systems, it is impossible to know exactly such a system would look like. The aim of the present chapter is to proceed, in a heuristic way, by pointing out for the planner possible means of to solving parts of the overall problem, namely by designing an infrastructure which, it is to be hoped, would be flexible enough to be integrated into a global system eventually.

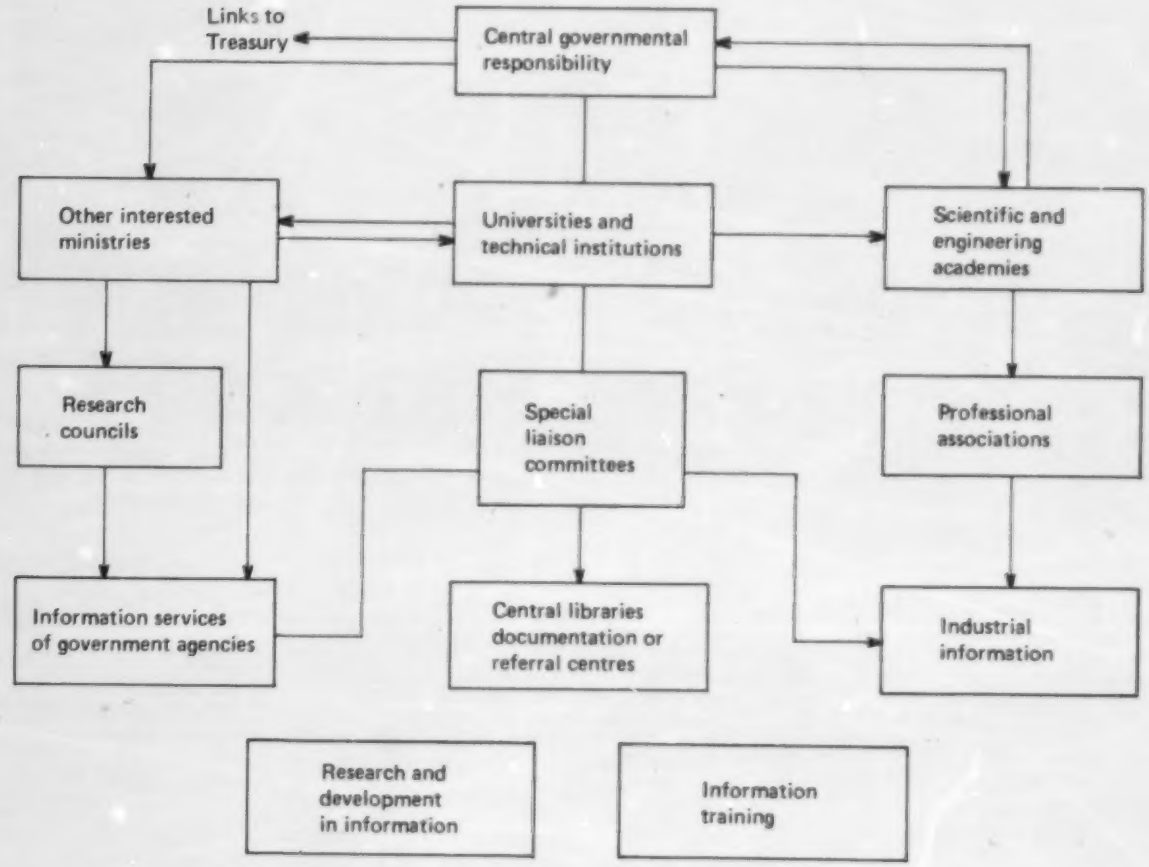
... and traditional systems do not offer much help.

That objective is the same for the developing as for the developed countries, and there is no point in drawing specifically upon empirical studies of existing library systems. For those who prefer the latter approach, a reference could be given to the UNISIST document SC/74/WS/52. However, it is evident that existing systems are, to a large extent, the result of ad hoc planning, based upon traditional and insufficient concepts and theories, when it comes to the planning of a global system. They have little to offer for the planning and design of sub-systems capable of changing their structures continually to adapt to changing user needs, new goals of society, and other environmental factors, and eventually to global integration.

Step-by-step planning not enough for creating a capability for change.

Nor is a step-by-step procedure valid for establishing the national information systems since such a strategy within a country would only serve to retrograde the country by several years and create a gap which would be difficult to fill because of the rapid changes which are continually taking place. Instead, it is preferable to create a capacity for change and adaptation, and planning should be such that a readiness is created to solve the as yet undefined problem of global system integration of national sub-systems. It is especially necessary to create a mechanism for influencing the sub-systems already existing, namely by using an indirect method, i.e. the planning of the planning system itself.

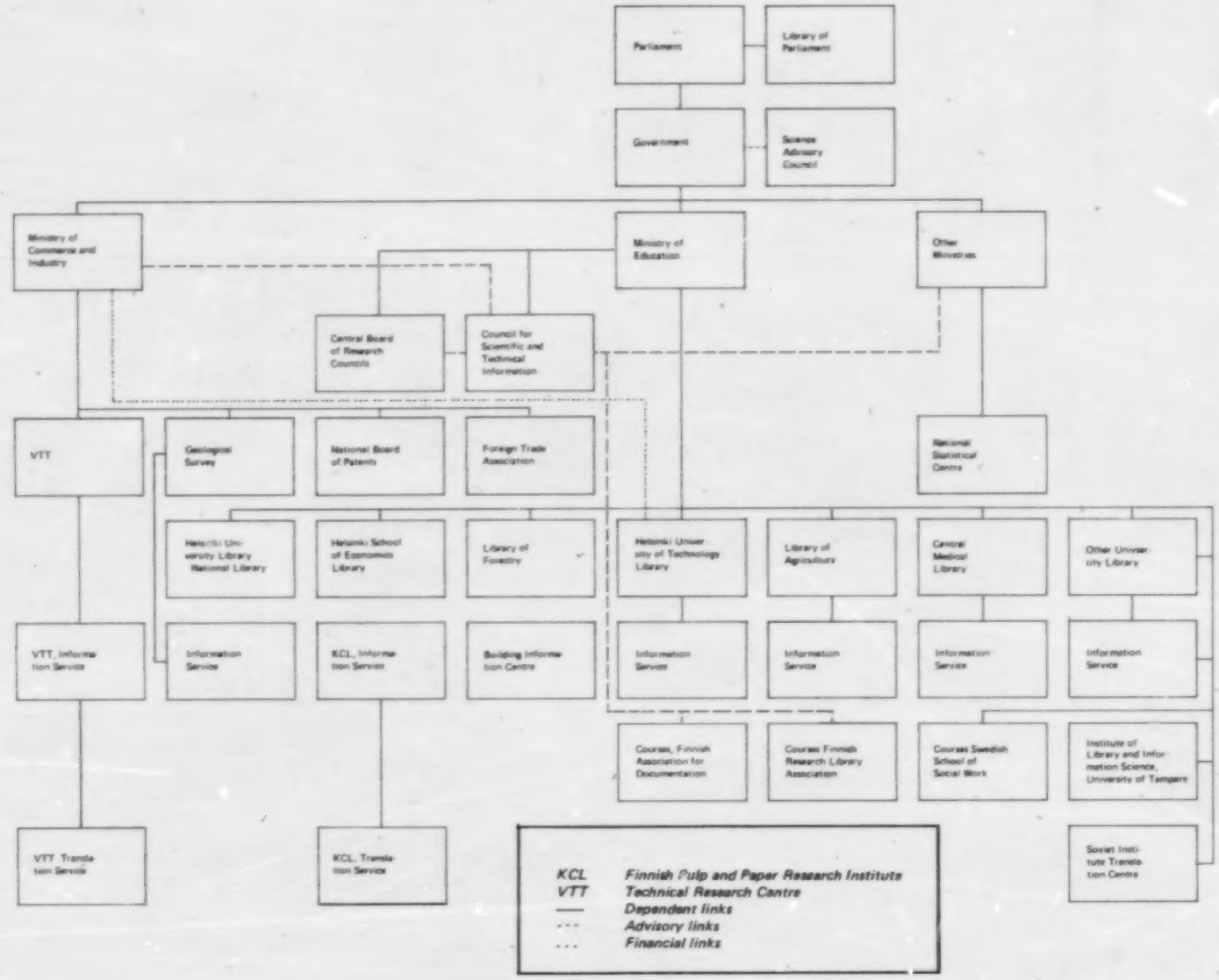
Fig. 1. The OECD/IPG General Model for an Organigramme



ORGANIZATION FOR SCIENTIFIC AND TECHNICAL INFORMATION IN FINLAND

Arrangement of data in the organigramme

The highest legislative body	A
Advisory bodies in government with responsibilities in science policy	B
Ministries or departments which have specific policy, co-ordination or executive rôles in scientific and technical information and documentation	C
Central co-ordinating focus for national scientific and technical information and documentation activities	D
The ministerial or departmental agencies or services operating. Scientific and technical information and documentation facilities	E
Universities (either public or private), technical universities and other academic establishments with particular interest in scientific and technical information services	F
Any other publicly available scientific and technical information services in the country whether in the public sector or not	G
	H
Training courses for information scientists	I
Publicly available translation services and translation centres	J



Concentrate on a few model centres

It is true that in a developed country the diversification and variety of information services are similar to those given in the list concerning information stores in Chapter II. At the same time there are now trends to concentrate and integrate various services. It was mentioned earlier that information and documentation activities could be integrated with library activities, provided that the communications were improved, and that school or college libraries could be integrated in public libraries.

A generous environment is a healthy one.

Such evidence shows that for a policy maker concerted action leading to the establishment of a few model centres is appealing,especially since after some years of operation they themselves will lead to further specialization and diversification, and thus, serve as examples for traditional organized centres such as libraries. If these centres are set up from the beginning in a generous environment of government support, they will be more willing to solve the user need problems in keeping with the terms of reference in Chapter II, than if they are subjected to detailed financial planning and policy restrictions.

A conceptual framework for planners is needed

The initial model

The diagnostic model

The planner needs a conceptual framework that should be elaborated in greater detail before concrete recommendations are brought forward. In any country the planner can envisage two quite different situations when designing the sub-systems, one being a situation in which he must more or less start from scratch : the new establishment or structure has to be designed as a sort of initial solution which will be referred to in the following text as the "initial model". The other situation is that of dealing with an existing system or structure which has already had an acceptable start. In this case what is needed is a model to change its activities into the direction of NATIS. Such a model could be necessary in the developed countries especially where the presently functioning systems are characterized by great complexity so that the required changes can be made. This planning model will be referred to as the "diagnostic model". In an existing system,the more differentiated the various elements or units are, the more difficult it will be to achieve integration or co-ordination. Special mechanisms might be needed such as special co-ordinators, cross-unit teams, or perhaps a whole section of integrators in the very central co-otdinating body.

The models are applicable in the developed and in the Third world.

This conceptual framework is of a rather general nature and could be applied in a developed country as well as in the Third world. The latter might, however, make better use of the first model, even if it could apply the second one for already existing organizations. Three basic factors influencing the implementation of the two models should be distinguished, namely : the level of aspiration which necessarily will be subjected to practical constraints because of the available resources, and the environment.

The level of aspiration is always a subjective factor depending upon how close the planner's own identification is to the general objectives for NATIS. In view of the resources, allowance must be made for both the physical and the human resources, their inertia or flexibility, and for the way in which a total resource combination could be achieved to suit the planning of NATIS. However as the aim is to make NATIS flexible, there is no need for very specific and detailed planning from the very beginning, since remaining flexible will reduce the need for carefully thought out decisions concerning new systems or structures so that it becomes less

essential than when dealing with the great inertia and built-up permanence of existing systems, units or structures. Since, according to authorative sources, the future outlook for the information sector is one of continued growth, it is always possible to find alternative uses for the resources which are allocated to such an expanding sector.

The segments of the environment

The third basic factor, the environment, has to be defined in more detail by distinguishing among four segments applicable in the case of NATIS :

a) the user segment which includes both the disseminators of information (gate-keepers) and the end users of the information services ;

b) the producers and suppliers of information, as well as of technology and human resources ;

c) the societal segment made up of government policy and official attitudes towards NATIS and its services ;

d) the technological segment in which the technical advances and development trends of NATIS and alternative sectors of society are included.

Permanence and irreversibility

As the first model - the initial model - entails decisions about physical structures, i.e. organizations, buildings and premises, equipment, electronic devices, etc., it must be realized that such decisions sometimes have irreversible consequences. Structures of this kind usually have a built-in permanence, and the long future period during which the decisions are consequent cannot be altered without involving costs. When the second model - the diagnostic model - is used, the forms of permanence and irreversibility the existing structures have taken must be identified before any plan for change is made.

New technology may lead to irreversibility

If the terms of reference in Chapter II are accepted, there is a commitment to invest in information/computer/telecommunications systems. Often such decisions concerning the commiting of a system to a new technology are irreversible because they also involve, decisions about structures such as equipment, tools, and electronic machinery. However, depending upon the depreciation time set, the irreversibility might only be limited to a few years.

Three planning levels

The conceptual framework proposed can now be enlarged upon by distinguishing among three planning levels, namely :

a) the highest or the strategic planning level ;
b) the medium or the resource planning level ;
c) the lowest or the operational planning level.

With this kind of framework it is easier to describe what the planning of the sub-systems and their functioning are to be, especially with regard to the decision processes, and how detailed the planning is to be.

Understanding should be translated into action

Chapter II attempted to analyse three problem areas, namely the need for information to industry, for educational improvement, and for decision makers, in order to create an understanding of the need for change and point out some of the conditions involved in the change process. The understanding gained so far should now be translated into terms of actual planning to solve these and other problems.

How much planning is needed ?

Before this can be done, an assessment of the amount of planning needed has to be made. To do so it is practical to re-examine the knowledge so far gathered on resources and environment, in view of the level of aspiration desired. Fortunately, the character of the required planning depends heavily on concepts and systems terms already agreed upon internationally by the Unesco Natis programme, cf. the objectives in document COM.74/NATIS/3, so that what has to be done is to discover how to change these terms into problem-solving terms of use in the planning process.

Knowledge about future help

First of all some estimates about the future are necessary in order to decide upon the length of the planning period. The future development within the four different segments mentioned above will influence the planning of NATIS. Therefore, some predictions about the future are needed. Many studies have been made about the future of the information field. The Anderla report "Information in 1985" (Paris, OECD, 1973) in particular summarizes many of them, and presents projections which have been generally accepted, at least with regard to Anderl's median values, as forecast for continued growth trends in volume, variety and interactions in the information field.

Planning for ten years ?

Since Anderl's forecasts embrace a period of ten years, up to 1985, this could be taken as the maximum length of the planning period which can be pursued here. It is no use to plan beyond the point in time where predictions and plans become mere guesses. However, it might be mentioned that there is a Japanese plan which is more ambitious : "The Plan for Information Society - A national Goal towards Year 2000" (Tokyo, JCUDI, 1973). Depending upon the credibility the planner wishes to attach to the forecast, his planning could cover a longer period.

Developments in other sectors

While Anderla's forecast primarily deals with the information sector per se, there is also a need for some more general predictions concerning the four segments of the environment, and the Japanese plan might offer some help, since it is rather comprehensive with regard to the last three segments. For planning purposes, reference could also be made to the works of the Club of Rome, Jantsch, Kahn et al.

Advantage of a project organization

Before going over to the organization form of the sub-systems, it should be pointed out that a functional organization can grow more easily by just adding new functional departments to it, while a vertical organization needs re-organization each time it is to grow by diversifying its functions. It should also be stated that, at least for the initial solution, a project organization is set up with a limited lifespan. In this case, the focus is on the specific project, and thus, conditions people to changes so that they can look forward to new challenging andpromising tasks once the start up phase has come to an end. In Yugoslavia such a project organization approach was recently proposed in planning to achieve a strategic change towards an embryonic NATIS by the establishment of sub-systems.

1. Planning for change using the initial solution

A rich environment will have built-in restrictions

It was pointed out earlier that the restrictions of resources and the environment influence planning for change. It was also mentioned that a generous environment would be beneficial to development. The strategy should therefore be to try to move the sub-systems into a rich and generous environment, instead of trying to design more and more elaborate systems to cope with a restricted environment with poor resources and poor outlooks for the future.

No master design to start with

As there must be cohesion with the total planning of the government, it is easy to see that at later stages any planning process becomes more and more restricted, even if at the early stage it is rather impossible to set up a number of constraints by constructing complete sub-systems within the framework of one grand master design decision.

Adaptation or re-organizations ?

The goal of planning is to achieve an adaptive system in a learning and self-organizing sense. In view of the aspiration level that must be conceptualized as an iterative process, both regular adjustments of the organization structures and special re-organization programmes are used to release the full creative potential of human resources included in the sub-systems.

Three implementation cases for choice

The "management-by-objectives" - philosophy which is underlined in the NATIS framework - can only serve as a rather general guide. For implementation, another technique must be applied, namely, to begin with, the initial solution, which can be used in three types of situations :

a) it can be used when planning the establishment of a completely new organization ;

b) it can also be used in order to formulate an initial solution for a new type of formal system in an existing organization ;

c) it can be used when an existing system functions so badly that the best alternative is to formulate a new start.

The advantage of incomplete integration

If the sub-systems within the information-documentation-library area are compared with those in the archival area, it is possible to conclude that the former should be differentiated to a greater extent than the latter, and that their environment seems to be more complex and diverse. What is needed is first to establish an "umbrella organization" for the former sub-systems. As a start it can be considered as an advantage for a country to have sub-systems that are not completely integrated : this will allow a reasonable degree of freedom of action.

Body for medium level tasks

Planning is concerned with how things ought to be, with designing structures to attain the goal, in this case NATIS. The task of the umbrella organization for the services within the information, documentation and library area is to perform medium-level planning of a co-ordinative nature,

distinctly separate from high-level planning which should be the task of the co-ordinating unit, the focal point, described in Chapter I. Depending upon the stage of development and the complexity of the country, there might be a need for more than one umbrella organization for the development and integration of sub-systems. For the archival area as well, an umbrella organization could be beneficial.

A central institute ?

One candidate structure is a body for combined policy-making on the medium level and for operational services. Such a body has often taken the form of a central institute. This model has often been proposed by Unesco to solve the documentation problems of developing countries. Examples are VINITI, INSDOC, CNRS, JICST, etc. This shows that equivalents are also found in industrialized countries. Such an institute would be both an umbrella organization for co-ordination, and responsible for operational activities. That the Soviet Union and Japan have solved their information and documentation activities along this model demonstrates that it has several advantages namely :

a) central management eliminates duplications and makes it possible to use unified routines ;

b) concentration of funds within a single organization ;

c) a unified approach and quality of services provided to the users ;

d) an excellent basis for introducing automated routines ;

e) consistency in fulfilling the policy set internationally and adopted by the focal point.

It should also be remembered that establishing an institute will provide stability once it has come into operation. It should further be borne in mind that starting an institute will provide stability once it has come into operation. The existence of such stability of form exercises side-effects on the evolution of other services, thus it has a catalytic effect.

Disadvantages of an institute

But this model also has some disadvantages. Many research institutes and trade association services would find it cumbersome to give up their own services, which may very highly developed, in favour of the centralized service of an institute. By its general nature, a central service will always be rather remote from the frontier of scientific research. Its services to scientists will, therefore, tend to be of limited and obsolete character. The same is often true for its service to industry : it might be far from the actual needs of the users. The very centralization into a single such institute will also provoke difficulties in co-ordinating its activities with those of other bodies.

Seeking for alternatives

The establishment of an institute is one initial solution model. The taks of planning is also that of looking for satisfactory alternatives. Another application of the initial model is the following. To move into a new environment which new technology opens up, good effects could be obtained by setting up an umbrella organization for planning and evaluating how the new technology could be put into use in existing or newly established sub-systems. A consultative committee or a board of directors/specialists could form such an umbrella organization. The first problem area, mentioned under paragraph "Sub-systems structure" (p. 9) in Chapter II, can be taken as example of how it would work. As a basic support for information to industry, the access to computerized services in one form or another should be assured. This means that the goal should be to set up a national information/telecommunications network which can be linked internationally, and to make terminals available in existing information services.

To choose a few project teams for operations

As a frame of reference for the umbrella organization, reference can be made to paragraph "Terms of reference for sub-systems" (page 18) in Chapter II. Its immediate task would be to design some projects and form project teams for the operations. When one or more teams which can administer projects have been identified by the umbrella organization, the planning of the projects should be put into action by releasing financial resources. In this case it would not be necessary to inflict too many constraints which could inhibit successful development. Instead of a detailed planning, broad guidelines could have more creative and innovative effects. As stated in Objective II of the NATIS document, there are various sources of international aid which could be approached if national funds do not suffice.

Broad scope for IDLA

The composition of the umbrella organization should be such that it provides a broad scope. Its terms of reference could even include what has been said in pages 12 and 18 of Chapter II. In order to point out that its scope is in the area of Information, Documentation, and Library Entities, the acronym IDLE could be assigned to indicate that the operational activities are located elsewhere, namely in the project teams ; but the essential task for IDLE is to plan for initiation, co-ordination, problem-solving when the teams are stuck, and changes within the NATIS framework. Such an umbrella organization would thus be idle intermittently, but would represent a potential capacity for change. Whenever the co-ordinating unit at the upper level decides to advance further towards the development of NATIS, the umbrella organization IDLE would have to undertake new planning. It is therefore important to keep it separate from activities such as managing projects.

The project team most important

To assist what has been called IDLE in the daily routines, i.e. calling meetings, preparing budgets, surveying projects, evaluating results, etc., a secretariat should be set up. This alternative model to the central institute places the emphasis on the project team which would thus be the most important decision unit formulating the basic strategy for implementing the development plans within the given financial means, while budget planning comes under the task of the umbrella organization.

2. Planning for change using the diagnostic model

For the unseen goal a heuristic approach is needed

The initial model is easy to apply when gaps have been identified either by scrutinizing the inventory or in the organization chart mentioned above. When it comes to the objective of NATIS "to encompass all services involved in the provision of information for all sectors of the community and for all categories of users" it was stated in page 12 of Chapter II that only a pragmatic or heuristic approach would be possible. The definition of a heuristic method is "a set of instructions for searching out an unknown goal by exploration, which continuously or repeatedly evaluates progress according to some known criterion" (cf. Beer, S., Brain of the Firm. London, Penguin 1972, p. 305). If the "unknown" character of the global integration of national information systems is taken as a basic point of departure for solving the more immediate problem of designing a national information system, the planner's understanding of the situation could be made use of to change it successively in accordance with NATIS concepts. It can be done in a heuristic, successive planning process by generating and testing out new solutions, i.e. testing the effects of introducing sub-systems or of changing or making additions to existing sub-systems.

Inventory and organization charts are good but more help is needed

It is the responsibility of the central co-ordinating body to affect the functioning of existing sub-systems in keeping with NATIS recommendations, and this can only be done by diagnosing their present functioning; this is the reason for calling the proposed method the diagnostic solution. Both the inventory and the organization chart mentioned above are of little help for the planner, as he needs to get down to sub-system level and identify deficiencies or desired improvements in functioning and pinpoint the way in which the individual sub-system will fit into the process of change towards NATIS.

Delegation needed

The advantage of the diagnostic model is that the planner need not have a full understanding of all the components forming the existing situation, as opposed to an engineer assigned to design a control system for a steel mill in which case he has to have a complete understanding of all the machine components. The planner, instead, uses the diagnosis of the change process itself to generate new decisions and actions. To keep abreast of desired improvements, the planner delegates the fact-finding procedure downwards to the very sub-systems. Even if he does not understand the full complexity of the planned "unknown" system, its structure can always be understood to the extent that he can either formulate "initial solutions" or develop alternatives for improving already existing sub-systems.

Decision variables can be used

Having reached an understanding of the situation, the planner can make use of all kinds of action and programmes to achieve the desired changes in the functioning of the sub-systems : seminars on NATIS objectives, intensive training courses, individual career planning, awarding of scholarships and fellowships, exchange of personnel, group training, supply of material and equipment, support of projects, etc.

Changes by a stepwise process

The diagnosis of the very change the use of the decision variables mentioned above will cause, means that planning is no longer determined only by the actual present situation, as it might appear from the inventory or in the organization chart, but is generated by the continuous diagnosis of the change process itself. A subdivision of the planning process could prove helpful :

a) an assessment of the extent and character of the change and planning needed to implement NATIS ;

b) a diagnosis of the existing process of change towards NATIS, ideas for improvements, testing of project proposals, etc. ;

c) decision making on the planning level, follow-up of how earlier decisions were made or implemented, their consistency with NATIS objectives, etc. ;

d) the implementation of the decisions into concrete action.

From the theoretical bases stated above, it is important to realize that the capacity for change towards NATIS cannot be built-in once and for all, but must be continually maintained and developed. As stated under the "initial solution" one or more umbrella organizations are needed for diagnosis and in discussions with the managers of the existing sub-systems. Such an umbrella organization has to draw upon consultants, project leaders, co-ordinators and work teams if the desired changes are to be implemented.

Re-organization or a new start ?

There are probably a number of situations in which a combination of the two models proposed above could be used. Especially in the case of existing but inefficient sub-systems, it would seem wise to apply the diagnostic model for re-organization, to identify why the old set-up failed, and to use the findings as major input for the planning process when formulating new initial solutions for existing systems. It is difficult to assess when an existing sub-system is worth building upon, and when a total re-organization in the form of a new initial solution could be the best alternative. It can be assumed that if a sub-system is given a new initial solution, its self-organizing properties could soon develop into an effective sub-system within the NATIS framework. In many cases such a soft approach might be appealing from a financial point of view, but the total costs incurred by such re-organization are often underestimated.

As a conclusion to this chapter it might be worthwhile to note that, from a broad definition of planning as a means of decision making to determine the organizational action necessary to attain the objectives of NATIS, a framework for planning the needed infrastructure has been proposed. The input factors are the planner's understanding of the level aspiration, the resources and the environment, and two conceptual models are put forward for action. For a country in which the concepts of NATIS are novel, the initial solution model could be applied without delay. The diagnostic model is more suitable to the development or improvement of functioning sub-systems

by making use of decision variables such as changes in the formal organizations, increasing the components, etc. The advantage of the proposed approach is that it is not necessary to assume that the planner understands the whole structure, or that all the factors which determine the functioning of the sub-systems are known.

Checklist for the third chapter on the establishment, co-ordination and integration of the sub-systems in NATIS

1. To clarify the situation it might be useful to draw up an organization chart of the formal, hierarchical organization of the essential elements of the country's information, library and archive units. An inventory of the existing resources could also serve as a basis for identifying gaps.

2. A good solution for starting the move towards NATIS would be to concentrate on a few model centres by giving them generous government support. However, on a long-term basis, your government has to create a capacity for change.

3. To do so, a conceptual framework is needed. Two models and decision variables have been proposed. Their application in your country depends upon its situation and environment.

4. The development of NATIS could need the infrastructure of "umbrella organizations" which could alleviate the central co-ordinating body of resource planning and detailed programming work.

5. Project teams should be given full responsibility for the implementation sub-systems, and projects in line with NATIS should be favoured.

6. How much future there would be in proposed projects can best be estimated from knowledge about the future, and it is recommended that some of the forecasts for the information field made by OECD and other organizations be examined closely.

7. The government has to decide on alternatives, and advantages and disadvantages of setting up national institutes or relying upon project organizations are shown. Your government could prefer combined action.

CHAPTER IV

SHORT, MEDIUM AND LONG-TERM PRIORITIES FOR IMPLEMENTING THE PLAN OF ACTION

"One of the most important events of the next decade will be the recognition of the true value of information - the right to information, reliable and relevant to the needs of the citizens, available in a useful form to all those who need it", this is a citation from the OECD report of 1971. Reference was made earlier to the Japanese study on the Information Society Year 2000, and if these projections are taken seriously, it can be assumed that around the year 1995 a national information policy will have taken 20 years to attain the proposed goals.

Working backwards, it would be realistic to imagine that the data bank requirements for the global interconnection of the national information systems - NATIS concept - will have been worked out by around 1985, which implies that national data banks will to a large extent, be operational by around 1980. Thus, not even five years remain to attain this sub-goal.

"It would be wrong to try to reach the trains of today with the timetables of yesterday", to cite a renown politician, Harold Wilson. A government wanting to make decisions for the implementation of NATIS has no choice but to anticipate the future and try to work out planning for the next ten to twenty years to come. The present chapter deals with the problem of setting priorities on a time-scale in keeping with the situation of tomorrow, rather than that of yesterday.

Today several countries have built up systems and acquired know-how for handling information in an efficient and economic manner by making use of present technology. Rapid technological development puts demands on planning within these countries, however, especially for system co-ordination and network development, and these demands are in no way different from those of the developing countries wishing to start afresh. In many cases the latter countries could be considered as holding a favourable position, because no decisions leading to irreversibility have yet been taken, and the field is open for them to make giant steps forward towards a new development. However, in many cases a major priority will be to find a mechanism which can essentially provide them with services on a technologically low-level to serve the primary industries.

The broad objectives in the NATIS documents to enable the developing countries to play an effective rôle in development, i.e. the

interconnection and utilization of modern information systems and networks, imply that in the short term each country will have to build up the facilities needed for its national access to the international pool of knowledge, and in the long-term tune these national facilities and development programmes to the overall NATIS concepts.

Another example of short-term and long-term objectives is the following. The short-term task could be to make the existing mechanized information services, which have recently become available in many countries, accessible to the present users of information through the traditional sources of information of the country, i.e. the libraries. There has certainly been a trend to develop entirely independent information centres alongside of libraries, but the need for back-up services for hard copy will need to be provided locally, regionally and nationally, thus, by a library network. It seems desirable to use the existing library services as a basis for the new systems, and such an approach will enable many libraries to develop techniques of managing the new systems, of integrating their use with the old, conventional systems, and will help them identify problem areas, and train staff. The long-term task is to make information services, which are technologically and economically feasible, available to all prospective users when and where they need them.

The point in these two examples is not that of discussing short- medium- and long-range planning. All plans have long-range effects. What is more important is to realize that although a plan may set the time dimension for specific tasks which have to start in order for timely results to be obtained, there is also a need to set priorities. The purpose of setting such priorities is to indicate the point at which scarce resources should be called into play.

The planning of a national information system does not deal with future decisions; instead, it deals with the futurity of present decisions. The questions the planner should raise are : "What do we have to do today to be ready for tomorrow ? What futurity do we have to build into our present thinking and action ? What time-spans do we have to consider, and how do we use this information to make a rational decision now ?".

Any plan for an information system will contain sub-goals which could be reached on a short-term or medium-term basis, but the essential point is that decisions with long futurity have to be made on a systematic basis by balancing the short-term goals with the long-term ones.

The setting of priorities according to their time-relationship can be aided to some extent by a precedence analysis, i.e. the designing of a chain of events in which the starting elements have to be identified ; this could often seem as difficult as to decide "which comes first, the chicken or the egg". There are several reasons why an effort to discover the precedence relationships between events is advantageous. The design of

the chain of decisions leading up to the national information system can be initiated at several points at the same time, and for the planning of the total system the establishment of more than one operational sub-system does not inhibit the overall solution.

The precedence analysis takes into account conditions such as :

. purpose, demand, need
if the establishment of C is desired, then A is a prerequisite ;

. dependence, influence, traction
if the existence of C is a fact, then A (and B) are influences on C ;

. support, facilitation, coalition
if the establishment of C is desired, then B is an aid ;

. growth, creation, production
if A continues to exist, then C (and D) will occur at same time.

The setting of priorities will depend upon how the planner formulates an idea of the relationships between the desired elements of the sub-systems. Even if the main question for the planner is "What do we need ?", the question "When do we need it ?" is just as important, for it sets the time for beginning work on new activities. The precedence analysis helps answer that question.

As an example of a plan which contains a broad objective, a scenario, sub-goals and priorities, the following could be used. It corresponds partly to the NATIS Objective no. 7 - Planning the organizational structure of NATIS, by setting out to reach a specific sub-goal.

The long-term objective for planned action

Introduction

The development of a National Information Policy is needed and a system will have to be set up to implement this policy.

1985 Scenario

Given that the above premise is accepted in 1985, we see an information network consisting of a central data base situated in the capital, linked to regional nodes in each region which in turn are linked to a sub-system of user data bases, with the capability at that stage of extension to individual user terminals.

The consideration for 1985 encompass a broader scope than the development of a modern inter-library system to include the extension of the network into other information establishments and into the "home-office" concept as the ideal information service for the future community.

Stating of sub-goals and criteria

Recommendations

1. A network of information centres should be established. Such an organization would allow the optimisation of the use of resources for the effective dissemination of information.

2. The present system of libraries should be upgraded and computer-based. We recognize that a system of libraries already exists and serves some of the functions of the proposed information centre on an informal basis. It would be desirable to incorporate existing institutions specialising in particular subject areas ; such a development could be seen as the country's contribution to the global concept of a network of information centres.

Setting up an umbrella organization Assigning responsibility

3. The network of information centres should be planned, co-ordinated and managed by a national agency. This is necessary in order to establish uniform standards for compatibility of equipment and operating systems. The national agency should have the responsibility for total bibliographic control of the national material.

Priority order

4. The national agency should be the prime source of current machine readable data bases where there is no existing instrumentality fulfilling that need.

5. The network should be developed in four stages :

a) the provision of computer and related equipment in each of the regional libraries and the integration of their data bases with the national library system ;

b) the provision of necessary equipment in major government, educational and research establishments and their connection to the main nodes ;

c) the inclusion of public libraries, other educational bodies and industry into the network ;

d) the extension of the network to include home users.

Constraints

6. During the early years of the development of the network, access to it should be through a recognized information centre.

Financing

7. The network of information centres should be adequately funded commensurate with the level of services that are offered and demanded.

From the example given, which is a sample taken from a more comprehensive plan, it can be seen how the plan points up the necessity for an infrastructure consisting of a national agency, regional libraries and information centres, the introduction of computers and related equipment, and the establishment of a network. In point 5 the priorities are set for the implementation of the plan. The decisions taken according to the plan indicate the direction the country will take in a near future.

Similar examples could be taken from other parts of the plan, to show, for instance, information services to education, promotion of user awareness, training of librarians and information officers, improving access to existing services, the creation of new services e.g. information to industry, etc., subsidies to publications, etc., where again main objectives, sub-goals and priorities are explicitly stated. The complex task of designing a national information system can, thus, be broken up into a number of sub-plans. The whole construction of NATIS is decomposable into sub-systems and their development can be designed to conform with the overall planning.

This property of decomposability is particularly prominent in the information field. As almost every country already has formal organizations such as libraries, archives, documentation centres, publishers and printers, etc., supporting them through the plan could generate evolvement more quickly than would be the case for starting afresh by establishing new organizations. The departmental boundaries of these formal organizations should make it relatively easy to implement a plan for sub-systems as long as the desired development is communicated from the top down along the already existing formal authority lines. The problem of linking sub-systems horizontally is,on the other hand, more delicate. Two alternative models are proposed in Chapter III, their usage individually or in combination can promote interaction.

When setting priorities a conflict arises between the aspiration level and the scarce resources which must be distinguished, e.g. manpower, funds, material equipment, know-how, etc. As with small business, small countries have limited resources, in particular as concerns knowledgeable men. A country wishing to develop its national information system will have to take the manpower problem into account by making the best use of those who are to administer the sub-systems. The crucial question the planner has to ask is "Which of the key activities proposed for implementation are such that there are key people available who can be assigned to them ?". Often, some activities will be ruled out or postponed, as an answer to that question and thus the priorities of a generous and well-wishing government will be changed.

The existence of documentalists, librarians or archivists does not mean that the successful accomplishment of a national information plan can be left to their responsibility. Ultimately, this is the responsibility of the government through the central co-ordinating body. On the other hand, planning needs the active participation of representatives of these professions, and the co-ordinating body could make planning a work group activity. In a number of countries planning has been formulated by a committee, but there are also examples where the government has assigned a single individual to draw up a plan. In most cases, this individual is a renowned, top-ranking specialist. In other cases the government has relied upon Unesco to provide experts to draw up plans.

If, for instance, a country invites a team of foreign experts to a confrontation on information policy, it will often find that the priorities set by the team turn out to be quite different from what their own national experts propose. The foreign experts are not under the same pressure from the environment to modify the priorities. The following is an example of a plan for a small country, but in this case it was proposed by foreign experts. An extract of the plan might serve as an illustration.

Goal-setting

The information network

The experts thought that the information systems might be oriented by mission or problem (or by industrial branch), with a facility for interdisciplinarity. It was felt that on-line working would make the system best suited for both SDI and/or retrospective searches. The systems should be designed and managed so as to facilitate co-operation among government, industry and the universities.

Sub-goals

The government should immediately begin to consider the design of a national network of information based on computerized information services, with a communications network linking these services, and on-line access for the users through remote terminals. The experts agreed that there is no point in the country's repeating the stages of documentary evolution which other advanced countries are now experiencing.

Priority proposals

As soon as possible, the detailed blueprint for a national network should be drawn-up and technical specifications prepared.

Delegation of responsibilities

Restrictions

The establishment of the new Institute for Information Science, proposed by the national commission, should be a priority action, and its Director should tackle the preparation of the blueprint and the specifications as his first job. The Institute should be given responsibility for action and for co-ordination, but should not itself operate information services.

Further tasks for the umbrella organization

The new national commission should be assigned the task of framing the main policy guidelines for the national information system, identifying the technical options and monitoring implementation. It should not undertake operational tasks, which should be left to the designated responsible agents.

Other priorities

Special attention should be paid to all aspects of information user training, including the promotion of individual information services as appropriate. Libraries should play an important part in this training.

Horizontal relationships underlined

The major industries are already developing their own information services : the relationship between industry and government should be further developed, so that both contribute effectively to the creation of the national information network.

This example, like the earlier one, stresses the need to utilize the novel technology, and illustrates plans with built-in futurity. They both show how general the guidelines could be drawn up in the plan. The foreign experts express themselves rather vaguely, and what they mean might not be quite clear for those who are to act on the plan. The need to render the general policy more substantial is, however, left in this case to the Director who is asked to prepare a "blue-print" and draw up "specifications" for action. This shows the need to :

. delegate responsibilities ;
. leave the details to those who are to do the job.

Many countries have a set of pre-existent sub-systems like the libraries mentioned in the two examples above. These have to be allowed for in the plan as invariant elements where the purposes of the plan is to find means of changing them into the desired direction, or of ignoring them temporarily by establishing new organizations. Rather than put too much emphasis on an inventory, i.e. the planner tries to find out "what is operating today", his concern should be to find out "what should be operating" which means that the plan should indicate which people, groups or organizations are involved.

As a conclusion to this chapter it should be pointed out that the setting of priorities depends upon the three basic factors, mentioned earlier: the aspiration level, resources, and the environment. There is no such things as short-term, medium and long-term planning, because every plan put into action will have long-term effects. On the other hand, there is a time-scale for implementing today's decisions about tomorrow's system, and that time-scale could be revealed by the proposed precedence analysis. The precedence relations could help to set priorities more realistically.

The environmental factors might ultimately change the priorities, because of various constraints, e.g. lack of qualified men, existing sub-systems, or, to cite a renowned information scientist, Harold Borko : "The president's brother-in-law is going to have to operate this, and if the plan does not conform so that he can do it, it will not be implemented", that is to say that the socio-economic environment puts up constraints which the planner has to be aware of.

Checklist for the fourth chapter on short, medium and long-term priorities for implementing the plan of action

1. Your government might find it useful to have a closer look at the scenarios, presented by the OECD report "Information in 1985", mentioned earlier, and as a planner you might, together with representatives of the information field, try to draw up a scenario for what the national information system of your country, as a desired goal, will look like within 10-20 years, taking into account the objectives stated in the NATIS documents.

2. The complex task of designing a plan and setting priorities can be divided up into parts where main goals and sub-goals are stated.

3. The purpose of priorities is to show when scarce resources should be put to work. The time dimension for specific tasks, which have to be started in order to obtain results when they are needed, could be estimated by means of a precedence analysis.

4. The plan has to take into account the relations between the resources and the environment and how they will be affected during the realization leading to the attainment of the goals.

5. The plan might be expressed in rather broad terms, provided priorities are set and responsibility is assigned for the detailed planning.

6. Any plan put into action will have long-term effects, therefore projects with built-in futurity should be given priority.

7. It might be advantageous for a government to initiate action at several points in parallel.

CHAPTER V

ORGANIZING, IMPLEMENTING AND MAINTAINING THE SUB-SYSTEMS

A modern-day government is confronted with the fact that, at the Intergovernmental Conference on the Planning of national documentation, library and archives infrastructures, it has consented to support the concepts of NATIS. As a national contribution it then decides to set up the organizational structure needed, and a plan is drawn up for the implementation of that goal. For the finance minister of the country the question then is : "How much will it cost ?".

The economic of it is just one of the questions, but of course, an important one. Economics has always had the reputation of cropping up everywhere, and the organization, implementation and maintenance of the sub-systems will depend on how the planner can come to grips with this problem by stepping down from high-level planning on the structure of the national information system, to what in the conceptual framework in Chapter III calls the medium level or the resource planning level.

The intention in this Chapter is to examine the kind of thinking necessary to carry out the plan by planning the required funding to cover the expenditures for manpower, technological aids and other necessary strategic investments as well.Conforming to the outlines of this document, this chapter will itself be concerned primarily with principles and concepts, and only incidentally with detailed procedures or problems in acquiring financial resources.

A major problem to be faced before going deeply into the costs, i.e. the budget for the plan, is how far into the future the expenditures should be planned for. Ideally, the planned expenditures should cover the several years which the plan covers, and this for a number of reasons :

a) long-term financing commitments provide a framework for the future development of those parts of the national system which need to be envisaged in advance ;

b) economy of size may make it desirable to build up a capacity in anticipation of user demands for information needs, e.g. from the educational system, the industry or the government itself ;

c) it usually takes a while from the time when the plan should be implemented until the money claims are spelled out for the operations ;

d) to acquire financial resources most often requires months ;

e) the initiation of several sub-systems at the same time will cause fluctuations in the amounts needed during a specific year, and longer term planning could stabilize the required investments over a period of time.

All these considerations underline the necessity of projecting the needed financial resources, at least in tentative terms, at an early date and for many years ahead. Too often plans have a tendency to overestimate the expenditure in the near future, and to underbudget for the later part of the planning period.

By planning for innovation in the information field even the poorest countries which have not yet started thinking in terms of telex, computers, microfilm units, etc., could find that investments could, for instance, generate educational progress and consequently promote social development. For example, the introduction of long distance instruction relayed by radio or television is a sample of an innovative procedure with built-in futurity, and comes close to realization in the information field which gives the country access to the world's store of knowledge by investments in receiving and processing means.

In this connection it would be trivial to state from past experiences that a well-defined technological objective, even such a lofty one as "putting a man on the moon", usually can be met, given enough money and adequate supply of qualified manpower. Even if the goal of installing a national information system according to the NATIS concepts is more down-to-earth, despite the fact that a country like Canada wishes to take advantage of satellite communications, and even if that goal might seem expensive in investment and operational terms, it will not produce great failures with political repercussions since several countries already have taken the lead with significant success.

However, no planning containing some forward-looking aims has yet been identified which can estimate the total expenditures required over the years. Governments might instead, have to rely on a rule of thumb : many of the industrialized countries devote around 5 % of the government expenditures for R & D to information, and the same often goes for industry, but higher figures are found. Governments of developing countries might think that the amount to be ear-marked to the NATIS should relate to other innovative programmes, say, in the educational area, or to the developing of primary industries, or might just state a cost figure for the programme development of, say, two to ten million dollars during, say two to ten years.

Even if such a broad-minded and generous approach is taken, no finance minister would fund a programme which gives no clearer specification of the costs involved. The central co-ordinating body will, in addition, need a form of summarized cost figures for its own information, since costs furnish a good basis for comparisons.

The cost classification could best follow the organizational structure drawn up in the plan : costs for the co-ordinating body, the sub-systems, specific projects, etc. The reason for this is that the funds which each head of the elements of the infrastructure will be allocated, are under his responsibility in the same way as the costs should be assigned to him for control. The cost variables are staff wages and expenditures for equipment, materials, etc. From the planner's viewpoint these variables are expressions of manpower and technology needs.

MANPOWER NEEDS

One of the important aspects which is a consequence of the plan, namely the establishment of new or improved sub-systems, is that these require specialists of many kinds if they are to be operated effectively. Manpower planning comes close to what happened in planning modern computers which through their genesis and infancy had to draw upon many professionals with completely different backgrounds ; a variety of disciplines have had to communicate via the computer thus opening the mind to the importance of multidisciplinarity.

In the development of a national information system it is the government's responsibility to ensure that a suitable mix of specialists of all the kinds needed is available when the operations start - specialists in the subject content of the sub-system, documentalists, systems engineers, programmers, education and training experts, librarians, reprographic staff archivists, record and information officers,etc.

It can thus be seen that developing a national information system calls for radically different talents and education for those who operate the sub-systems and those who are to use them. A difficult task will be to find persons suitable to head the new sub-systems. One problem will be to render the positions of project leaders sufficiently interesting to attract young career people. This does not mean that for exemple older librarians would be obsolete : they are simply not trained. It is clear that if the personnel in the existing sub-systems is to learn to function in non-traditional ways, a series of new approaches to their education and training will be needed.

Any country will find that suitable manpower is the scarce resource, as stated in Chapter III. The planner has to take this into consideration and propose means of overcoming this deficiency. Even in a small country, the different functions needed for the preparation and execution of the plan cannot be carried out by the central co-ordinating body alone. Earlier it was recommended that participation in planning is needed from various quarters. The planning of manpower is of the same ilk, especially, since it has to be seen as a continuous process based on some kind of organization. Most countries have created an administrative function or unit to organize, stimulate and co-ordinate the planning for manpower development. Its task is to estimate how many specialists should be trained at various levels over the next ten to twenty years, the duration of their training, the nature of their functions and their status. The establishment of this function has to be taken as a priority task, as was stated under point 5h in the checklist to Chapter I.

A recruiting and development programme for personnel has to draw from many professions which means that in general the professional status of the new professions will have to be raised in order to overcome the lack of qualified manpower in the field. From the cost side, this means a rise in salaries for qualified personnel and for those who assigned responsibilities. It also means costs for scholarship and fellowship programmes, teacher training courses, visiting professorships, consultants, experts, courses for continuing education, etc. Graduate education is the task of universities, but the plan should encourage graduate programmes in the information field.

NEED FOR TECHNOLOGY

The development of international information networks is carried on stepwise in organizations like ESRO, IAEA, FAO and others. At the same time, individual countries or regions such as Australia, the Federal Republic of Germany, France, Great Britain, the Scandinavian Countries, Spain, U.S.A., etc., are attempting to develop physical networks of their own. In France and Germany the main emphasis is to provide an organizational infrastructure which itself clearly defines the subject areas in which the network centres will work as nodes. A few American networks operating a variety of databases on computers in the U.S.A. are penetrating into Europe and other parts of the world.

From the NATIS viewpoint these different approaches are in no way conflicting. The networks are starting to interlink, and operating centres will form nodes in a broader world-wide network. From the user's point of view this offers possibilities of access to a broad spectrum of databases. The expansion of TYMNET and the database information brokers like Systems Development Corporation, and Lockheed Information Systems in California, make it possible for a country to have access to a variety of data bases at low investment costs. The operating costs are related to the telephone call and the hook-up time to a specific data base.

This means, for many countries, especially small and developing ones, that there is no sense in installing a few big computers as processing nodes, in the hope that such a network will spread when a number of terminals are installed to motivate the traffic. Instead, the installation of small terminals, in some cases upgraded to "intelligent terminals" in universities, libraries, institutes, firms, etc., could be both a feasible and desirable goal while using the preexistent telecommunications for dial-up purpose to foreign computers. The prices for such terminals are now being lowered by 10-15 % a year, and could correspond to the costs of a few electrical typewriters.

If a country wishes to build up data bases of its own, e.g. for a legislative information system, a reliance on minicomputers, teleprocessing to a time-shared computer, could prove more cost effective than a centralized solution. The distributed and decentralized utilizations of data bases is the best solution internationally.

It should also be mentioned that a small system built up from minicomputers could be expanded, in increments, by adding more processor and memory modules to it. There are hundreds of information storage and retrieval programmes available, which is why an early implementation can be made by acquiring them as gifts, or renting or buying them from the system owner.

The concept of the interactive library or archive is now feasible through the impact of the developments in the capacity of data storage, processing and transmission devices. Proper investments in terminals and minicomputers, telex, microfilm devices, etc., will not prove detrimental to the economy, nor involve too many uncertainties and risks. Instead, such investments would create the munificent environment which could promote the necessary innovation in the information field compared with a fixation to conventional methods.

Following these morale-building deliberations, the conclusion is, that for a large class of problems in the information field there are now cheaper solutions than the purchase of large computers. It also should be noted that vendor's advice might be good, but it would be an even better idea to ask for the views of independent consultants through the intermediary of, for instance, Unesco.

FINANCIAL RESOURCES

From this chapter it is obvious that any plan for the development of a national information system will require funds for salaries of local staff, contracts with data base owners, consultants and experts, and expenditures for equipment, material, telephone bills, etc. The plan has to set price tags so that the government could see what the development of the national information system will cost.

The following is an example of how the recommendations in a development plan could be converted into cost figures. Estimates could always be based upon comparable action in other countries. Focal points for NATIS or UNISIST in any country are certainly willing to contribute such cost figures, or Unesco could help from its broad experience of various missions to a number of countries. As financial constraints will be self-generating when the various sub-systems come into operation, because of the need for future development of the services, the budget for the very first years should be rather generous, and expressed under broad headings and the planner should leave the detailed budgeting to those who are going to do the job.

Extract of a tentative budget for a development programme for the national information system

Programme proposal no.	Programme title	Thousands of dollars 1. year	2. year	3. year
1	Strengthening the library resource in university and public libraries	50	200	500
2	Microfilm programme for safeguarding unique archival material	10	50	50
3	Sub-systems development	50	100	150
4	"Industrial liaison officers"-programme	20	40	60
5	Experimental projects in national data base establishment	10	20	40
6	Network development	20	80	80
7	Terminals, minicomputers, data base charges	50	200	100
8	Fellowship programmes, courses, visiting professors	60	100	200
9	Participation internationally in ISDS, UBC, INIS, AGRIS, etc.	50	80	80
10	Additional projects, materials, etc.	10	20	50

Can such a 2.5 million budget covering a few years be realistic ? Many small industrialized countries have thought so, to judge from their programmes. Such a budget expressed in broad terms has some advantage, because if the amount is not needed in one area it can be shifted over to another without a new government decision. Each programme point can in turn be broken down into cost figures. The following might serve as an example :

Extract of draft project budget for the period 1975-1978

	No. of man/yrs.	1975	1976	1977	1978
Project manager	3.5	15 000	30 000	30 000	30 000
Sub-system for scientific information					
System analyst	2	15 000	30 000	15 000	
Statistician	0.5	15 000			
Sub-system for materials from abroad					
Purchasing consultant	0.2	5 000			
Systems expert	0.2	5 000			
Sub-system for educational information					
Systems expert	0.5		15 000		
Consultant services for other sub-systems	2.0	15 000	30 000	15 000	
Fellowships, 16 fellowships for a 6-month period		29 600	29 600		
Equipment and material		29 500	29 500	32 500	16 800

To a certain extent, the implementation of a plan will have as a consequence that existing staff in libraries and archives could be shifted over to the new job opportunities afforded by the plan and at no extra cost. Furthermore, the best use of installed equipment raises problems about charging for the services delivered, especially to industry. The plan need not take such cost recovery into account, even if certain services could be charged for.

Costs subsequent to the establishment of the central co-ordinating body which have not been included here, and the establishment of the various sub-systems, can only be stated generally. The costs beyond that time will depend on how many activities the body undertakes and its order of priorities, how fast the growth rate accelerates. Experiences elsewhere show that it will do so rapidly if efficient services are provided.

The costs for establishing a national institute with operational goals can also, to a certain extent, be broken down into ;

. Establishment costs ;
. Processing costs, including computer facilities ;
. Building and furnishing ;
. Document collections ;
. Staff salaries, etc.

A well-balanced plan might put a strain upon the national economy. At the same time it might attract interest from various sources of international aid, e.g. the United Nations agencies, the United Nations Development Programme, bilateral arrangements with donor countries, and even the direct help from foundations. Countries like Canada, Federal Republic of Germany, France, Soviet Union, U.S.A., etc., have special sectors in their aid programmes for promoting information activities. Canada, for instance, offers CAN/SDI - a very effective information retrieval programme, and advisors and training personnel go with it to avoid attendant start up difficulties.

The following citation from the NATIS document might be comforting for the finance minister : "The development of well-designed archival and records management systems may help to reduce significantly the general administrative expenditure and to increase the efficiency of the investments under government control".

Checklist for the fifth chapter on organizing, implementing and maintaining the sub-systems

1. A budget for long term financing commitments is needed to obtain a government decision for implementing the plan.

2. Rough estimates of the costs for a plan can be made by using rules of thumb, or by relating it to other innovative programmes. Five per cent of the R & D costs could be taken as standard in industrialized countries.

3. The budget could classify the costs according to the organizational structure drawn up by the plan.

4. A manpower development programme will be needed, but the use of consultants and foreign experts could speed up implementation. A special function has to be established for such manpower planning.

5. The new information/computer/telecommunications technology calls for equipment of other kinds than centralized computer systems. In the network costs, a country could only share in the costs of terminals and mini computers.

6. A budget can be broken down into rather broad headings, and the detailed budgeting would then be left to hose who are to do the job. They would also be held responsible for the costs accrued.

7. In specific cases, i.e. for receiving foreign aid, further breakdown of the budget could be necessary. Some examples of international sources for financing information plans are given.

CHAPTER VI

PARTICIPATION OF THE NATIONAL SYSTEM IN REGIONAL AND INTERNATIONAL SYSTEMS

The adherence to the NATIS concepts means an increasing reliance on and strengthening of international co-operation as a means for using the world's store of knowledge more efficiently. It implies both the setting of a national information policy in harmony with other countries, and the establishment of operational units whose activities and routines are compatible with or convertible to international standards.

The Unesco documents, both budget and planning Unesco documents are those concerning NATIS and UNISIST, strongly underline the point of national participation and international co-operation in the development of worldwide information systems. There is no use in stressing this necessity any further here. Instead, a few points of interest for the government or planner will be mentioned.

In the earlier chapters, recommendations were made for the setting up of an organizational structure, e.g. a central co-ordinating body, an "umbrella organization" or a national institute, a function or unit for manpower development, that is to say, a bureaucracy. In developing countries in particular a bureaucracy is often taken as a sign of reform and planning. But the hiring of bureaucrats does not raise the qualitative standards of the existing national system, if they are not given the opportunity to exchange views with their counterparts in other countries or internationally. Nor does the paper-shuffling for launching the plan for the national information system produce results of compatible nature, as long as the execution of the plan is not given over completely to the operational units which should also be given the means to compare their standards internationally.

There is, thus a necessity for any country which wants to see its information efforts become part of a broader context, to interact on two levels : the policy level and the operational level. Too often bureaucrats from developing countries are sent to take part in technical discussions on operations in international context from which it is evident that the final results will never be implemented in their own countries because the information will never sift down to those who should do the job. The industrialized countries instead send their operational specialists who profit from the technical discussions with their counterparts as can later be seen from the development of their daily operations. The government has the responsibility for selecting administrative people for policy discussions, and operational people for technical deli-

berations internationally, otherwise red tape and bureaucracy might hamper the development of the information system.

Closer co-operation among policy makers can be acheived by more active participation in the work carried on in the field of information by international organizations such as Unesco, FAO, IAEA and others. Within these programmes there are more technical sub-programmes for the interlinking of countries and they could more profitably be followed by the managers of the sub-systems. Active participation might be beneficial both for the country itself, and for the international work. Some international programmes are run as projects from Unesco by professional international associations, like IFLA, FID, ICA. Many countries have left the participation in these organizations to national associations which in cases receive support from governments, but they do not necessarily represent the government's point of views. In these cases the government can reserve its political decisions for the policy work in Unesco, etc.

It has also been pointed out that special attention should be given to the possibility of pooling resources of smaller countries to avoid the necessity of duplicating national sub-systems. Regional co-operation is awarded a specific goal from the side of the international organizations, because they are often more willing to support regional programmes than those of individual countries.

The ideal situation internationally is reached when all countries give and take. Most of the developed countries do not produce more than a fraction of the world's store of knowledge, but they are able to draw from the full stock by overcoming the communications barrier. That means that they are increasing their lead in the production and usage of knowledge with respect to most of the Third world countries. It has often been claimed that computer-based information systems are too expensive to be used in small countries and in developing countries, but even the Third world could benefit from the new social innovation of interactive libraries and information centres without basing their action on the premise that such activities, which would lead to international linkage, need to be built around big computers and related hard and soft technologies.

Small countries like the Scandinavian ones have realized that national library and information networks cannot be self-sufficient. They have to be extended over a larger region for common utilization of the resources of several national networks. The same principle seems applicable for the developing countries.

As knowledge is a national resource, and every country should try to increase and make use of that resource, it is essential to make every effort to arrive at an interlinkage with other countries, even by so called "network parasitology". The procedure is to upgrade the available techniques from ordinary mail, airmail, telex, telephone calls, interactive terminals on dial-up bases to leased line interconnections, so that the country could consider itself to be a node in the information/computer/telecommunications network, and not a self-contained, bureaucratically run

national "information empire". If a service in another country of the region is found to be better or more developed, the usage of it from a national point of view will free forces for other activities, and, thus a division of labour between countries can take place.

This short chapter has no checklist. Instead, a reference is given to a paper explaining "network parasitology", namely : Törnudd, E., Benefits from Network "Parasitology". - In : The Interactive Library. Proceedings ed. by S. Schwarz, Stockholm, TLS 1975, pp. 67-75.

CHAPTER VII

PRINCIPLES OF LEGISLATIVE FRAMEWORK

Each government will have to frame its legislation in the light of its own circumstances, and it is up to the planner to propose legislative action. There is a large body of literature including several model Acts which might serve the planner as guidelines.

However, the very brief treatment here is especially directed towards the developing countries by outlining some principles. Unesco is planning more comprehensive guidelines in this field, so that a country, when launching a policy for NATIS development, could avoid finding itself involved in a mesh of detailed, direct and individualized control measures set up by the legislation for all the components of the NATIS, often to an extent never experienced in industrialized countries.

A legislative framework laying down the policy in broad terms is certainly needed in most countries, but there are examples of the contrary. For instance, the entire development of public libraries operates without any government legislation in Sweden. Generally, the establishment of the plan and its financing, the organizational framework such as the central co-ordinating body and its responsibilities, as well as the setting up of a national institute need to be authorized by a government decree.

Copyright, privacy and the right to equal access to information are other areas to be defined by legislators. There are also a few explicit fields for such action, namely :

- ensuring the legal deposit of national publications ;
- safeguarding the nation's archival heritage against all endangering factors ;
- enabling career evaluation with regard to status and educational level ;
- facilitating international relations.

The adherence to international agreements facilitating the "free flow of information", e.g. the "Florence Agreement" or the "Beyrut Agreement" need to be codified as well.

There may further be legal structures which have already been set up in the country and could as a consequence of a new national information policy, require changing. The existing legal structure in the telecommunications area could in particular, need reappraisal to condition the country for nationwide information exchange or the establishment of networks, nodes and terminals for access to the world's store of knowledge.

For the further execution of the national information policy, the developing countries urgently need to change, wherever it is possible, from direct and individualized legislative action for each sub-system or each information project to a management by "purse-string", properly adjusted to give inducements in line with the goals of the national information policy.

Within the budget figures fixed by the long-term plan, and disseminated to the sub-systems and projects, the operational units should be given responsibility to carry out the assigned tasks. Control will be exercised at the end of each fiscal year when new budgets are submitted for funds to continue work. The central co-ordinating body could then shift the allocation of funds depending upon the results achieved or not achieved. The ample provision of funds, especially in the beginning of the execution of the plan, could have more beneficial effects on the plan than a detailed legislative framework.

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